

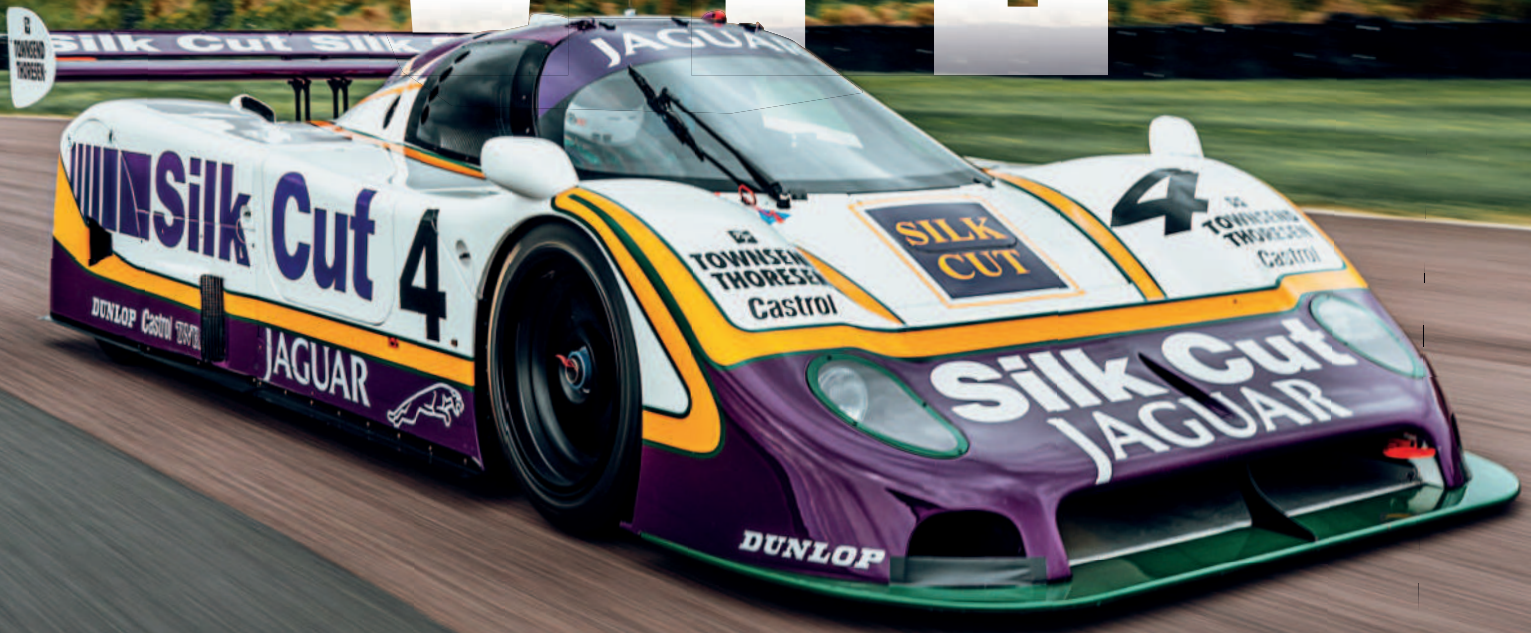
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Ear protection at the ready for Jean-Pierre Beltoise's Matra MS120B in 1971. Find this and more in our celebration of all things V12

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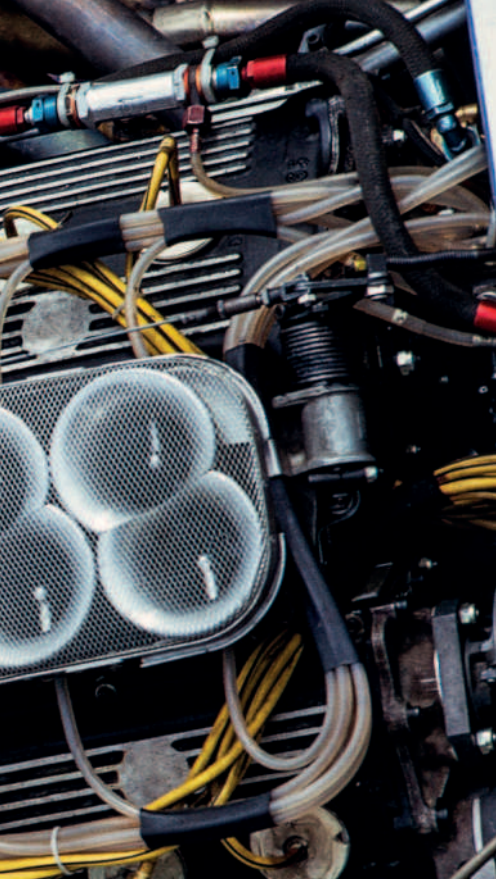
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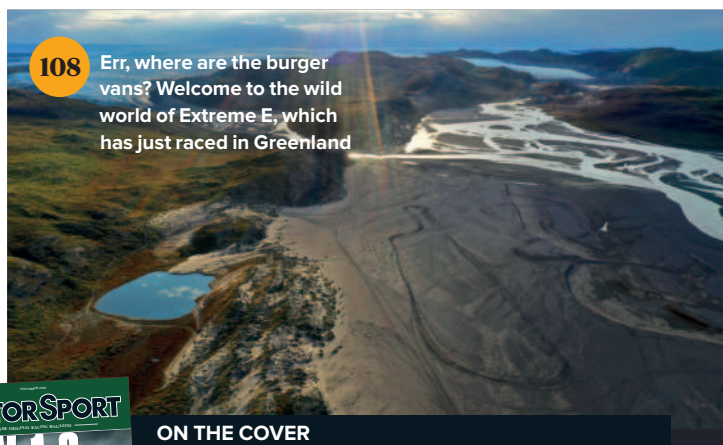
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**101** Pato O'Ward is one of a number of young hotshots to have taken up residency on the IndyCar podium







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**T**HERE IS A MOMENT IN THE NEW Michael Schumacher documentary when David Coulthard relives the infamous collision at the 1998 Belgian Grand Prix. As you will remember, the lapped Scot slowed on the racing line as the Ferrari of Schumacher approached. In the pouring rain there was no chance for Schumacher to see him and he ran into the back of Coulthard's McLaren costing him the race.

Damon Hill went on to win for Jordan and Schumacher was seen storming over to the McLaren pits in what can politely be described as a state of high dudgeon. But the documentary, which was released on Netflix in September, stays with Coulthard as he goes to relate what happened next: "We met the week later in Monza. We sat in Bernie's bus and I said: 'Look Michael, surely you have to accept some responsibility because you're the one who ran into me. I didn't reverse into you.' He said: 'No, I don't see it that way.' And I said: 'Well, surely you are wrong sometimes?' And he went: 'Not that I remember!'"

The face of the man who is now president of the BRDC still registers genuine surprise and bemusement as he tells this tale even after all these years and it indicates a fundamental truth about his adversary. As this fascinating documentary shows, there was a singularity about the way Schumacher raced that has perhaps still not been entirely matched.

What sets the documentary apart from the others that celebrate the seven-time world champion is the way it reveals more than we have ever seen before about what he was like away from the track. Using home video and photographs we see Schuey doing karaoke, picking his way painfully through *My Way*, skydiving over Dubai and messing around with his kids. After the shocking moment-of-madness crash at Jerez in the 1997 European GP, when Schumacher deliberately rammed Jacques Villeneuve resulting in his disqualification from the season, we discover that he and a 30-strong entourage of family and friends headed to Norway to get away from it all. Home movie footage shows the driver roasting wurst over a campfire and being dragged behind a snowmobile on his back. It is a wonderful peep behind the curtain of privacy that shrouded Schumacher even before his skiing accident.

The film was made with the co-operation of the Schumacher family, including his wife Corinna and manager Sabine Kehm. As such it clearly goes easy on some of the more controversial aspects of Schumacher's career.

## THE EDITOR



**Coulthard:  
"Surely you  
are wrong  
sometimes?"  
Schumacher:  
"Not that  
I remember"**



*Racing at the Movies*, a new special issue of *Motor Sport*, celebrates the great films and documentaries of the past decade. It is available in the shops or readers can order direct from our website. [motorsportmagazine.com/shop](http://motorsportmagazine.com/shop)

Yes, it analyses the unforgivable Jerez crash, but it has no less a voice than Ross Brawn on hand to explain that Schumacher was convinced Villeneuve drove into him rather than the other way around. But still the film is a powerful reminder of the talent that once bestrode F1 like a colossus, and it was a pleasure to be reacquainted with the names that dominated my late-teenage Sundays - Irvine, Alesi, Häkkinen, Barrichello.

It occurred to me while watching the documentary that future generations may well look back on these past few years as a golden age for factual motor racing films. As we explain in a new *Motor Sport* special issue, *Racing at the Movies*, the trend was started by Asif Kapadia with the wondrous *Senna* back in 2010 (part of his superb trilogy of factual films including *Amy* and *Diego Maradona*). That film took the basics of storytelling and wove together a compelling narrative using meticulously uncovered archive footage to drive the action. It is by far the best such film ever made, but it is not alone. The 2017 film *Williams*, tracing the story of Formula 1's first family, is both revealing and moving, and by using interviews not only with Claire and Sir Frank but also key players including Nigel Mansell, Alan Jones and Sir Jackie Stewart, it fills in gaps you didn't know existed. Despite having been made with the assistance of the family it is unflinching in a way that *Schumacher* is not - and has the air of tragedy about it too.

Then there is the clumsily titled *Ferrari: Race to Immortality*, also released in 2017, which tells the tale of Enzo's tainted golden age through the exploits of Mike Hawthorn and Peter Collins. Its footage, much of it dug out by Richard Wiseman, the unsung hero of many such documentaries, transports you back to 1950s Italy in a way that you barely believe possible. For more technicolour thrills there is the exploration of the Isle of Man TT bike race, *Closer to the Edge*, a film summed up by Mat Oxley as, "A rollercoaster of a film: one moment the hairs on the back of your neck are standing up, the next moment you're welling up."

It's as good a description as you can get of the emotions we all feel when watching the various storylines of our sport unfold.

*Joe Dunn*

Joe Dunn, editor  
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**NEXT ISSUE:** OUR DECEMBER ISSUE IS ON SALE FROM OCTOBER 27



# MOTORSPORT

IN THE SPIRIT OF BOD AND JENKS



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## Details matter.



In 1979, Ferrari's 3-litre flat-12 engine, *left*, sweetly serenaded Jody Scheckter and Gilles Villeneuve to a glorious title 1-2 for the Scuderia in Formula 1. But why does it appear in our V12 extravaganza (p66)? Because, as DSJ was always keen to stress, it's a flattened, 180-degree V12: opposite pistons share a crankpin, each pair moving left or right in tandem. That's different to a boxer engine, where piston pairs surge towards and away from each other. Now dive into our 34-page paean to the dozen pots.

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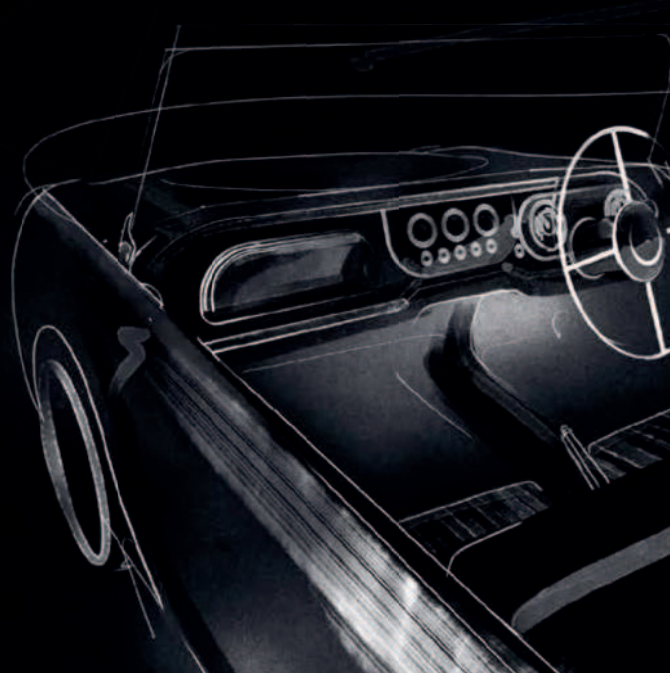
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# MATTERS *of* MOMENT



## Hall of Fame 2021: help us decide the next racing great

It's time for a further intake of sporting legends, and *Motor Sport* needs your vote!

**W**HAT MAKES A RACING great? And who qualifies as one? These are questions we have all asked ourselves at some point - and probably been the basis of a heated debate with a fellow enthusiast. And since 2010, *Motor Sport* has been asking you, our readers, to help us decide the answers.

Our annual Hall of Fame awards seek to create the definitive list of all-time greats and celebrate their achievements. The list features names from across all the disciplines and eras. It includes Ayrton Senna and Jim Clark, Stirling Moss and Jackie Stewart. Valentino Rossi and John McGuinness, Derek Bell and Tom

### *Formula 1*

#### **1 / Jenson Button**

The 2009 world-beater and talisman of F1's ultimate underdog team, Brawn GP

#### **2 / Nico Rosberg**

The 23-time GP winner is the only man to beat Lewis Hamilton to a title in the hybrid era

#### **3 / Kimi Räikkönen**

F1's most prolific driver, with a record number of starts. Won the 2007 title.

### *Le Mans*

#### **1 / Allan McNish**

Three-time Le Mans winner, whose influence now stretches into Audi team management

#### **2 / David Brabham**

His outright 2009 win with Peugeot capped a three-year winning streak after GT1 success

#### **3 / Emanuele Pirro**

Never finished off the Le Mans podium from 1999-2007, with five outright wins, all for Audi

### *Legends*

#### **1 / Michèle Mouton**

Blazed a trail for female rally drivers and now plays a major role at the FIA

#### **2 / Nelson Piquet**

The Brazilian won two titles with Brabham and one with Williams in the golden 1980s

#### **3 / John Watson**

British Formula 1 hero who scored five GP victories. He now commentates on GT racing



A trio of drivers whose legacies  
defy their single world titles.  
Who's your Formula 1 favourite:  
Räikkönen, Button or Rosberg?



Kristensen. It also celebrates those people who have given to the sport in ways other than simply winning races. Sid Watkins is there and so too are Adrian Newey and Colin Chapman.

Of course, other such lists exist elsewhere. And all have their merits. But what sets our Hall of Fame aside is the way the names are chosen - by popular vote from a group of names decided on by the *Motor Sport* editorial team.

We like to think that because our readers are among the most knowledgeable motor racing enthusiasts in the world, and because they exhibit such sound judgement (as evidenced by their choice of publication!) the resulting list provides the most definitive answer to who really is a motor sport great.

Every year we are staggered by the number of readers who cast their vote via our website. This time we have introduced a few changes. For a start we have narrowed the shortlist in each category down to three to make the choice simpler. More controversially we have loosened the criteria for making it to the shortlist to include those competitors who may not have retired from the racing arena (a strict condition of previous nominations).

This means, for example, that this year we include Scott Dixon in the US Racing category. Yes, he is still competing at the top level aged 41 - this year being his 18th Indy season - but with six titles to his name and 51 career wins (only AJ Foyt and Mario Andretti have won

more) he more than qualifies and shouldn't be left out on a technicality. We have also, where possible, tried to compare like with like and offer readers a choice of drivers who competed against one another or who have similar records. So, in the F1 category, all three nominees faced each other in period and all three have one World Drivers' Championship title to their name.

As in previous years, casting your vote couldn't be easier: simply go to our website and click on the Hall of Fame article which will bring up a voting form. We will announce the winners before Christmas when we will welcome five more names to the *Motor Sport* Hall of Fame. Happy voting!

## US Racing

### 1/ Scott Dixon

Six-time IndyCar champion and 2008 Indy 500 winner, who is still going strong

### 2/ Jimmie Johnson

With seven NASCAR Cup Series titles and 686 races in 20 years, he's a stock car supremo

### 3/ Hélio Castroneves

The four-time Indy 500 winner is a Brazilian who won the hearts of American fans

## Engineers

### 1/ Charlie Whiting

From rallying to Surtees, Brabham and then F1's race director. He's much missed

### 2/ Wolfgang Ullrich

Some said he was mad, but he led Audi to a diesel revolution at Le Mans and beyond

### 3/ Mauro Forghieri

Ferrari's technical visionary who counts rear wings and the flat-12 among his innovations



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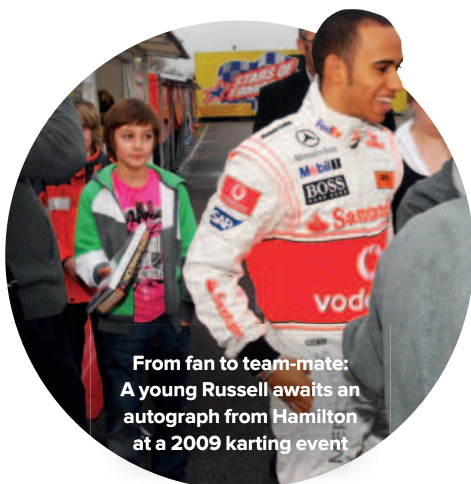
# Bitter Bluebird battle heads to court

**D**ONALD CAMPBELL'S REBUILT BLUEBIRD K7 water speed record boat could be broken up once more if an ownership dispute cannot be settled. Coniston's Ruskin Museum has formally requested the team which restored the wreck to return it, citing possible legal action that could result in the reconstructed machine being dismantled.

Some 34 years after Campbell's fatal 1967 crash, the jet boat's partial remains were lifted from the bed of Coniston Water by engineer Bill Smith, and were then given to the museum by a family trust led by the record breaker's daughter Gina Campbell. In 2006 a volunteer team headed by Smith agreed with the

museum and the family trust to restore the craft to operable condition at no cost to the museum and to return it for display. Meanwhile the museum raised over £750,000 to build a new wing for it. Opened in 2010, it has been awaiting its centrepiece ever since.

After Smith's team reassembled the missing cockpit, forward structure and sponsons and sourced a Bristol Orpheus jet engine the boat was ready to run, but Smith says negotiations to use Coniston stalled; instead he tested on Loch Fad in Scotland in 2018, reaching 156mph. From there relations between the two parties deteriorated, both sides disputing the agreement and whether



**From fan to team-mate:**  
A young Russell awaits an  
autograph from Hamilton  
at a 2009 karting event

## Russell finally gets Mercedes chance

**I**N A SPORT LIKE FORMULA 1, WHERE MONEY talks louder than any other commodity, it's not often that common sense prevails. But in the case of George Russell and Mercedes, F1 could have a major boon on its hands after the German manufacturer announced it will field a British superteam from 2022.

Russell will line-up alongside seven-time champion Lewis Hamilton in a Silver Arrows next year, replacing Valtteri Bottas, who will move across to Alfa Romeo to replace the retiring Kimi Räikkönen. The switch has been

a long time coming, with Bottas never looking like a solid title contender to Lewis across his five years with Mercedes. His consistency has helped Merc to dominance in the Constructors' Championship, but in a way it has also robbed F1 of a genuine title fight for many years.

Russell isn't your usual F1 driver. He's clawed his way up the ranks and repeatedly outperformed his back-of-the-grid Williams. Mercedes' next task will be to manage two talented and competitive drivers to try and avoid a repeat of the Hamilton-Rosberg days.

ALAMY, MIRRORPIX VIA GETTY IMAGES, JAYSON FONG





Hydroplane racer Ted Walsh tests the rebuilt Bluebird in Scotland in 2018. Below: Donald Campbell with K7

the reconstructed elements give the Bluebird Project (headed by Smith and formed in 2012 into a not-for-profit company) joint ownership. Smith says that without his team the museum has neither skills nor facilities to maintain or run it, adding that the complex running operation needs more time than the 28-day annual period specified by the museum.

Jeff Carroll, deputy chairman of the museum trustee board, told *Motor Sport* that they had since offered the Bluebird Project a three-month running window but that had been rejected.

Smith told us: "We promised an operable boat to our sponsors and donors, and our

volunteers have sweated blood and tears on this. We've built the difficult half, a very complex assemblage, but if we have to dismantle it we'll remove all our parts and give theirs back. We'll put it back together as fast as it came down. We'd welcome legal action to get us round a table. Let them bring it on."

Carroll said: "The Campbell family's deed of gift says the boat should be restored and handed over to the museum. There was never a mention of joint ownership. We are grateful to Bill and his team of volunteers for doing the

**"If we have to dismantle it, we will remove our bits and give theirs back"**

work, but it was always to be a labour of love. Now he has shifted his ground on ownership and running time. It's not so much mission creep as mission leap.

"Whatever condition we get her back in," he continued, "we intend to put her into working order and to run her. We have people ready and able to do that."

Speaking to *Motor Sport*, Gina Campbell said: "Bluebird belongs to the museum, and the nation. I promised the museum it would return to them and now I'm unable to fulfil that promise. It's heartbreaking."



Final lap for the most famous Mercedes of all. Gert Straub drives Susie Moss on the car's last outing

## End of the road for the Moss 722

ONE OF THE MOST STORIED RACE CARS IN history has been officially retired 66 years after its most famous win.

The Mercedes 300 SLR, No722, which was driven by Stirling Moss and navigator Denis Jenkinson to victory in the 1955 Mille Miglia, made its final outing in the Stirling Moss parade at the Goodwood Revival in September.

It will now be transported back to the company HQ in Stuttgart where it will be kept

on static display. Insiders say that the car has now become too valuable and too fragile to run at events.

722 has held special significance for this magazine ever since Jenkinson, *Motor Sport*'s continental correspondent, penned his era-defining account of the race for our pages. Its retirement comes a year after the death of Moss, and marks the ending of a chapter for many race fans.

The car has been looked after by Gert Straub, a Mercedes engineer, for the past 25 years. Straub is also retiring and fittingly it was he who drove the car at the Revival.

*Motor Sport* wishes both 722 and Straub a long and happy retirement.



# Last of the old guard

**G**ORDON SPICE, WHO HAS DIED AGED 81 after a long battle with cancer, was one of British motor racing's great characters and one of the finest tin-top drivers of his generation.

Born in London, Spice always claimed motor racing was secondary to his business interests, which included a successful car accessories company, though his CV hardly reflects as much. Despite his successes, he insisted that he never took it too seriously. As he said when *Motor Sport* took him out for a *Lunch With...* in the October 2017 issue, "I wouldn't want to be a racing driver today given the monastic lives so many of them seem to lead. If someone had said to me, 'You have to make a decision: you can either go on drinking and smoking, or else be a racing driver,' I know which I'd have chosen. It wouldn't have been racing."

Spice began his competitive career in 1962 with an MG TF, and made his first appearance in the Le Mans 24 Hours just two years later at the wheel of a Deep Sanderson, though the car overheated early on. For the balance of the 1960s he became a fixture in the British Saloon Car Championship in a variety of Minis and he took the class title in '68.

From 1970-1972 he dabbled with the European F5000 Championship and obtained a few decent results, but there was never much money - and what he had

invariably ran out before the season was through. After switching to the recently introduced production saloon category in a Ford Capri for 1973, he had another crack at F5000 in 1975. He won the second race of the season at Oulton Park - having correctly opted to run wets on a bright, sunny day, as a consequence of melting banks of snow that were soaking the track - but suffered serious injuries later that summer in an accident at Mallory Park.

"I went to the Caribbean to recuperate, and learned to drink rum and that has been my only tippie ever since - a direct consequence of my F5000 shunt." When he returned, he promised that he would never again race a car "without a roof".

At the wheel of a Capri, he won his class for five straight seasons (1976-1980) in the British Saloon Car Championship, without ever taking the title outright, and in 1978 he shared the winning Capri with Teddy Pilette in the Spa 24 Hours - the last major event on the original road circuit.

In the 1980s he added further strings to his bow in sports car racing. Having established his credentials as a works driver for Rondeau, he acquired the assets of the disbanded Ford Group C team and set about taking on the cream of endurance racing, initially running customer Group C2 cars, then building his own C2 and, later, C1 chassis under the Spice Engineering banner. It was typical of Spice's attitude and showed not a little courage. There were some good C1 results including two podium finishes in 1989. Overall Spice took four class victories at Le Mans, twice finishing third overall and scooping the FIA Group C2 World Championship title on three occasions - twice in his own cars.

For all that, he appeared not to try too hard ("I never went to a gym and never gave up drinking on the night before a race," he said). Gordon Spice was a very fine racing driver.



Spice was a key member of the ambitious Rondeau Le Mans team, and finished on the podium in 1980





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# MARK HUGHES

## “Williams’ recruitment of Alex Albon was part of a seismic political shift”

**W**ITH THE LONG-overdue confirmation that George Russell will replace Valtteri Bottas at Mercedes next year, a sequence of other driver moves was triggered. One of these - the recruitment of Alex Albon to replace Russell at Williams - was part of a seismic political shift within the sport, one which may have determined the format of the new power unit formula, due for 2025 (but probably set to be delayed to '26).

The disruptor in this whole story is Volkswagen. It was poised to enter the original hybrid formula and was a participant in the discussion stages of it, just as it has been this time around. But then ‘dieselgate’ came along. Such was the commercial damage inflicted by that scandal, it’s taken this long to make a VW F1 programme feasible again.

Formula One Management (FOM) decided some time ago that the new power unit formula would be another internal combustion/electric hybrid one. There was very little further discussion on that. The differences in opinion centred around how to make them cheaper and simpler. One way of doing that - which VW heavily favoured - was to abandon the ERS-h which is such a significant part of the massive thermal efficiency of the current power units. VW’s motivation in this isn’t difficult to divine; it’s a complex technology impacting upon the whole concept of the PU and of which the existing manufacturers have many years’ experience. Nullifying the head start of the others would have obvious appeal to VW.

At much the same time all this was evolving, Honda had decided it was leaving F1 at the end of this season. In response, Red Bull established Red Bull Powertrains, an all-new engine manufacturing entity which will for the remainder of this formula run a Honda continuation power unit under

a different name. But what about under the new formula, when Red Bull would have to go it alone?

Mercedes, Ferrari and Renault all wished to retain the ERS-h feature. The technology ostensibly uses exhaust gases to feed power to the battery but can be spooled up electrically to make turbo lag an obsolete concept. The H part of the ERS equation allows the energy flows to be sent back and forward in hugely sophisticated ways, and mastering that is very much at the root of what makes a successful hybrid F1 engine. Mercedes was first to understand its full possibilities and the others steadily came to reach a similar level of understanding. But it took several years. Honda’s initially disastrous programme sent a terrible message to any other would-be F1 power unit manufacturers. The PR was negative for a long time before reaching the glory days of now (ironically, just as it’s about to pull out).

Part of the idea of the new PU regulations is to meet the commercial imperative from Formula 1 to bring in another manufacturer - and the only one interested didn’t want this ERS-h technology. VW and Red Bull could see some common ground here. Red Bull wasn’t necessarily committed to the ERS-h. So that was potentially two votes against three and with FOM very keen for VW to become involved. But time was pressing if the regulations were to be drawn up and the PUs readied for 2025. It needed to be voted on very soon.

At the Dutch Grand Prix Toto Wolff was campaigning that the ideal Russell replacement for Williams would be the Mercedes Formula E champion Nyck de Vries. Albon, he said, was a concern to him because of his ties to Red Bull. He didn’t want Albon to learn all about the Mercedes PU in

the Williams and report it all back to Red Bull. Given that Williams has long been closely aligned with Mercedes, it seemed that might be that.

But Albon’s confirmation as a Williams driver while still retaining links to Red Bull suggested a new alliance between VW and Red Bull. With Williams involved as well. Why? Because the CEO of Williams, now under new management since its sale to private equity group Dorilton, is Jost Capito. Who just happens to have deep ties to VW after heading up its motor sport operation between 2012-16 and more recently running its performance road car division.

The Red Bull Powertrains programme for the next gen engine and the VW programme seem set to being one and the same. But they each have their own vote in the engine manufacturer group. If just one of the three pro-H manufacturers could be persuaded to change its mind, suddenly it would be a fait accompli and H would be gone.

The engine manufacturers meeting at Monza are understood to have agreed a new power unit without ERS-h technology and which will be simpler and cheaper. The FIA issued a short statement about

it afterwards: “The discussion was positive, and progress was made - some details remain to be addressed; however we expect these to be resolved in the coming weeks.”

Although it is widely expected that the new formula will be delayed by a year to 2026, the deal is essentially done and F1’s political landscape may just have shifted quite dramatically.

**“The Red Bull and VW programmes seem set to being one and the same”**

Since he began covering grand prix racing in 2000, Mark Hughes has forged a reputation as the finest Formula 1 analyst of his generation  
Follow Mark on Twitter @SportmPhMark





## MAT OXLEY

# "The first six bikes at Silverstone all came from different manufacturers"

**T**HIS YEAR'S BRITISH MOTORCYCLE Grand Prix at Silverstone created MotoGP history: the first six bikes past the chequered flag all came from different manufacturers, the first time that's happened in 49 years. First over the line was Fabio Quartararo's Yamaha YZR-M1, the Frenchman joined on the podium by Suzuki GSX-RR rider Álex Rins and Aprilia RS-GP rider Aleix Espargaró. A fraction of a second behind the Aprilia came the Ducati Desmosedici of Jack Miller, then the Honda RC213V of Espargaró's younger brother Pol and the KTM RC16 of Brad Binder.

A good mix of machinery is always liked by fans, but what kind of a mix was this? During the last decade MotoGP rights-holder Dorna has created closer, more TV-friendly racing by writing technical regulations that essentially make all the bikes the same: same 81mm cylinder bore, same tyres and same electronics.

The result of clone racing is inevitable - the closest racing ever. This year's Doha Grand Prix had the first ten riders finish within 5.4sec of each other, a difference of just two tenths a lap.

Racing was very different in 1972, when the Yugoslav 500cc GP was won by Alberto Pagani on an MV Agusta four-stroke triple, with the first six riders home on different brands of bike.

Pagani finished 1min 40sec ahead of Chas Mortimer, riding an over-bored Yamaha 350cc two-stroke twin, followed by Paul Eickelberg, riding a König, powered by a four-cylinder two-stroke outboard motor.

The fourth, fifth and sixth finishers were all lapped: Guido Mandracci aboard a Suzuki XR05 two-stroke twin, Bo Granath on a Husqvarna two-stroke twin, engineered from two 250cc single-cylinder motocross engines, and Charlie Dobson, on a Kawasaki HIR two-stroke triple, basically a pimped-up road bike.

These last three motorcycles had interesting stories but the König was something else. Half-litre two-strokes had dominated hydroplane racing during the 1960s, so it was only a matter

time before someone had the notion of bolting one into a racing motorcycle, because surely a two-stroke 500 could beat a four-stroke MV 500? The 500cc title was there for the taking!

The man with the idea was Kim Newcombe, a motocross rider from New Zealand who was working for a marine business in Australia. The moment he spotted a König outboard motor in summer 1969 his life changed. One call to Dieter König in Berlin and he was on a boat to Europe to build a 500cc grand prix bike.

You probably don't need to be told that this wasn't a straightforward project. The König flat-four was effectively two 250cc twins sharing the same crankshaft. For marine use the engine was mounted on its side, with the vertical crankshaft driving the propeller from its lower end, each pair of cylinders pointing towards bow and stern. Newcombe rotated the engine 90 degrees, so the König became a horizontally mounted flat-four, with all four cylinders fed by a twin-choke downdraught carburettor that delivered fuel/air mix through one huge rotary valve, driven by a toothed belt that turned 90 degrees off the crankshaft.

His next problem was the transmission; while a hydroplane doesn't need a gearbox, a racing motorcycle definitely does. Newcombe used a Schaffleitner six-speeder, but here was another problem. The gearbox was bolted to the rear of the engine, driven via open primary chain, which made the motorcycle longer than desirable.

For several years Newcombe toiled endlessly and mostly alone on his creation: think, design, fabricate, test, develop, race, maintain and repeat. Step by step, against all the odds, he transformed the König into a competitive 500cc grand prix bike.

Eickelberg's third place at Opatija in June 1972 was the machine's first GP podium. A year later Newcombe returned to the deadly street

circuit on the Adriatic coast to score König's first grand prix victory, which took him into the championship lead, ahead of MV Agusta's Phil Read. This was the world turned upside down: the mighty Agusta marque, winner of every 500cc world title since 1958, humbled by a contraption that had more than a hint of the Heath Robinson about it.

Newcombe rode brilliantly, spending every other waking moment fettling his masterpiece, still mostly alone. After all, this was a two-stroke, so its appetite for pistons, piston rings and crankshafts was exhausting.

Further podiums at Assen and Anderstorp kept Newcombe in the title chase. However, grands prix paid atrociously low prize money, so between each round privateers had to contest non-championship events. With no points up for grabs, these meetings attracted riders by paying decent start and prize money.

In August Newcombe travelled to Silverstone for a big international event. Before practice he asked the organisers to place hay bales in front of a wall of railway sleepers on the outside of Stowe corner. His request was refused. During the race Newcombe crashed at Stowe, hit the railway sleepers and died three days later from head injuries. The 1973 500cc World

Championship ended six few weeks later at Jarama, Spain, Newcombe the posthumous runner-up to Read. (The story of Newcombe and the König was recently brought to life in the excellent documentary *Love, Speed & Loss*.)

Dieter König lost interest in two-wheel racing after Newcombe's death, but his engines were hugely successful in sidecar racing, where packaging was less of a problem.

**"While a hydroplane doesn't need a gearbox, a racing bike does"**

Mat Oxley has covered motorcycle racing for many years – and also has the distinction of being an Isle of Man TT winner  
Follow Mat on Twitter @matoxley





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## DOUG NYE

# "How many really recall any 1991 WSC rounds with much affection?"

**I**T'S HARD TO BELIEVE IT'S 30 YEARS SINCE world-class endurance racing virtually died on its feet. Only eight FIA World Sportscar Championship rounds were run in 1991, and in general this entirely noble form of racing was being strangled by the near-total pre-eminence of Formula 1.

Back at the end of 1988, new 3.5-litre naturally-aspirated engine rules had been announced for the category, despite doubts amongst manufacturers of how attractive such a prospect might be. The governing FISA body extended the life of the preceding turbocharged cars to bolster grids. But a turbocharged-car weight penalty of 100kg - added to the preceding weight limit of 900 - caused alarm. FISA later allowed Porsches to run at 950kg everywhere except Le Mans, while any other previous-Formula cars had to observe the 1000kg demand.

In contrast the new 3.5-litre 'atmo' cars could weigh just 750kg. They were also allowed to use Formula 1 fuel brews instead of the race organisers' standard pump grades. Their pitstops were speeded by gravity-feed refuelling and (remarkably) were guaranteed the top 10 starting-grid places - probably for promotional photographic purposes (to bury the old makeweight junk behind).

Sprint-race distances were slashed from 480km to 430 so the 'atmo' cars would need only two refuelling stops. Perhaps as a sop to traditionalists the Le Mans 24-Hours was re-admitted to World Championship status, the ever-independent ACO having ploughed its own furrow for the three previous years.

Amidst typical Jean-Marie Balestre (unlamented FISA president) bureaucratic chaos a Championship emerged involving only four manufacturers - Jaguar, Mercedes and Peugeot backing the 3.5-litre Category 1 (apart from Mercedes running an old C11 Coupe at 1000kg in the opening races), while Mazda ran its rotary-engined design in the full series (as required to gain an entry at Le Mans).

Ross Brawn, then of Silk Cut Jaguar (Tom Walkinshaw Racing), had spent much of 1990 creating his ground-effect aerodynamics 'two-seater Grand Prix car' - the Jaguar XJR-14 with a Jaguar-badged Ford HB 72-degree V8 engine. Having shone in initial testing, it seemed in performance terms set to dominate the opening 1991 Championship round at Suzuka only for Martin Brundle to retire after two laps when a dropped lead cut his car's engine, then team-mate Derek Warwick's car had a starter motor failure after his first stop. Peugeot won with Mauro Baldi/Philippe Alliot driving.

At Monza, despite problems, the Silk Cut Jaguars then finished 1-2, the Brundle/Warwick car winning from its Teo Fabi/Brundle sister - TWR using just three suitably compact drivers to share their two compact Coupes.

Silverstone then saw Fabi/Warwick win from Karl Wendlinger/Michael Schumacher's Mercedes C291 with Brundle a solo third in the sister XJR-14. Derek had swapped to join Fabi after the XJR-14 he should have shared with Brundle lost time with a broken throttle linkage. The FISA stewards controversially docked his points for winning in the sister car - which lost him the WSC Drivers' Championship. By this point in the season some XJR-14 shortcomings had been identified - low grip in slow corners, sometimes chronic understeer...

At Le Mans, the Silk Cut-TWR team ran four XJR-12s instead, with enlarged 7.4-litre V12 engines. But the 1000kg requirement meant they were outrun by both the Mercedes C11s and the little ear-splitting Mazda which won - yet Jaguars finished 2-3-4.

By the time the WSC series resumed at the Nürburgring in August, Mercedes and Peugeot had caught the XJR-14s in performance terms but lacked their reliability. Martin Brundle, concentrating on F1, was replaced by David

Brabham, who shone - winning the race with Derek Warwick, and sharing second with team-mate Teo Fabi.

The story changed at Magny-Cours - Peugeot's Yannick Dalmas/Keke Rosberg (no less) and Alliot/Baldi 1-2 in 905Bs - the XJR-14s only 3-5. Peugeot dominance was repeated in Mexico City, 1-2, while Fabi's XJR-14 non-started with an engine problem and Warwick finished only sixth after another starter motor failure.

Still Derek's sixth place was enough to clinch the World Championship title for Silk Cut Jaguar and TWR. Fabi had a 10-point lead in the Drivers' Championship and clinched it in the final round at Autopolis (who remembers the Japanese circuit?), where Wendlinger/Schumacher won for Mercedes, from Warwick second and Fabi/Brabham third for Jaguar.

But never mind who remembers Autopolis - how many really recall any of those 1991 WSC rounds with much affection? Forty years earlier, the Jaguar C-type had won at Le Mans

co-driven by Peter Whitehead/Peter Walker - and the anniversary of their success has been rightly celebrated this past year. The 1991 TWR Jaguar operation had a fraction of its rivals' budgets. The Jean Todt-managed Peugeot advanced apace from mid-year - thanks to an all-new aerodynamic form, plus Michelin tyre strides.

In November 1991 the FISA Sportscar Commission then announced there would be no such World Championship in 1992. Peugeot, having invested so much, screamed blue murder. A 1992 series was run, with only six rounds - five won by Peugeot, one by Toyota. Not until 2012 would an 'official' FIA World Series be reinstated... after a sad hiatus.

**Doug Nye is the UK's leading motor racing historian and has been writing authoritatively about the sport since the 1960s**

**"Derek's sixth place was enough to clinch the title for Silk Cut Jaguar"**





# ANDREW FRANKEL

## "If you drive a modern car, even its handbrake will have a microprocessor"

**T**HE MICROCHIP CRISIS THAT is affecting the ability of manufacturers to build cars the world over shows no sign of going away. It has been created by a perfect storm of events which, once understood, illustrates why there is no easy fix.

The first reason is the simplest: as cars become ever more complex, there is ever greater demand for microprocessors. If you drive a remotely modern car even its handbrake will likely have one. But the real problem is Covid. When demand for new cars fell through the floor early last year, factories were shut down and production slowed to a crawl, leaving chip manufacturers with what would have been an existential crisis. Except that just as demand for cars crashed, for the same reason demand for chip-hungry home entertainment systems went through the roof. And the chips used in that industry are more profitable than those used for automotive. So having been chucked overboard by the car industry the chipmakers are discovering that the lifeboat isn't such a bad place to be after all. In fact it might be better and more lucrative than the ship. So there is little incentive to get back on board.

The ramifications of this are quite extensive: long waiting lists for new cars, and those cars that are built often being radically shorn of chip-heavy equipment from electronic dashboards and mobile telephone charging pads to some active safety equipment. But where most people will likely notice the change is not in the cars they'd like to buy, but those they already own. To give you two examples, the now 10-year-old Toyota Aygo I bought for my daughters to learn to drive is now worth at least what I paid for it five years ago. And the three-year-old Golf we use as a general purpose family retainer appears actually to have gained in value. I can't sell either because I'd probably lose all I gained replacing them, but if you have almost any kind of second-hand car you've been

thinking of shifting and not replacing, there has probably never been a better time than now.

I'M NOT IN THE HABIT OF DOING BOOK REVIEWS here but I thought I'd just mention Paul Ehrmann's *Arc of Triumph*, not just because it's about racing drivers but because although it is a novel, it is inspired by those drivers who joined the Resistance to fight the Nazis in World War Two. It's some distance from the learned and important treatise on the subject that is Joe Saward's *The Grand Prix Saboteurs*, but if you want a read that is easy, enjoyable, imaginative but also accurate and informative, you'll find all of the above between its covers.

EARLIER IN THE MONTH I FOUND MYSELF AT Thruxton to drive the Jaguar for this magazine. And there I was standing in the paddock, chatting away to another couple of drivers who, like me, were suited, booted and ready to go and drive racing cars. It was between the Spa and Zandvoort weekends so naturally talk fell to our disappointment in the former and hopes for the latter. And we were talking about this and that when I was suddenly hit by a dose of imposter syndrome, probably because those drivers were Damon Hill and Martin Brundle. Martin I've known since I was employed to write a book about Bentley's return to racing 20 years ago, but while I've met Damon a couple of times I don't know him at all.

So I asked him if he still held the lap record for the circuit. He paused as if it had been decades since he last even thought of it then said, "I guess so," in that charmingly self-effacing way of his. That record was set all the way back in 1993 when Damon turned up for a demonstration run in his Williams-Renault FW15C at the circuit's 25th anniversary celebrations and duly dispatched its 2.3 miles lap in 57.6sec, at an average of over 147mph.

Thruxton in substantially less than a minute: it is a feat quite beyond my powers of comprehension. Yet while Damon would have been out to put on a good show and entertain the crowd, he'd hardly be risking all at qualifying pace at Britain's fastest and one of its least forgiving tracks. I expect the car had only a baseline set up and probably whatever gear ratios were still in it from the last race. It makes one wonder how fast he could have gone if he'd had a proper go at it.

The Jaguar was not the only iconic sports car I drove this month. I was also asked to demonstrate the 2003 Le Mans winning Bentley Speed 8 to those attending the Bentley Drivers Club meeting at Silverstone. How do you drive this near priceless, unique historical artefact? The answer is quickly, because to do otherwise is to rob the crowd of their spectacle. Actually it's quite easy because unlike the Jaguar which is 15 years older and has a heavy road-derived

engine, the Bentley is endlessly reassuring to drive. And so fast you can put on a decent show without taking the smallest risk.

I was interested to see how I'd cope with climbing out of the fastest Bentley ever made into the oldest still racing today in which I was due to compete shortly thereafter. The 22nd Bentley ever built and 100 years old this year,

it has no front brakes, a centre throttle, a crash gearbox and fuel you need to pump by hand. You'd think the Speed 8 experience would warp entirely your perception of velocity and make you a menace driving something so slow and clumsy so soon after. But no: I drove the old car as if I'd never driven the fast one at all. Truly the human brain is an amazing thing.

**"I asked Damon if he still held the lap record. He said, 'I guess so'"**

A former editor of *Motor Sport*, Andrew splits his time between testing the latest road cars and racing (mostly) historic machinery  
Follow Andrew on Twitter @Andrew\_Frankel



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Daniel Ricciardo celebrates scoring McLaren's first grand prix win since 2012 after his Monza victory



# Trackside view

Formula 1's first triple-header of the season brought drama by the bucketload. From McLaren breaking its duck, to Max and Lewis breaking each other (again)... not bad for two and a bit races

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 Belgian GP
  Dutch GP
  Italian GP

# Two out of three ain't bad for Verstappen

Red Bull's team leader wins a race (and a bit) to extend his lead before clashing heads again with Hamilton, says **Mark Hughes**

ONLY TWO OF THESE EVENTS were actually races. In Belgium, for the first time in the championship's history, points were paid out essentially on the qualifying order as the unrelenting Spa-Francorchamps rain ensured there wasn't a single piece of racing, just a total of three laps behind the safety car. Conditions of almost zero visibility on the long straights

ensured that at no stage was the track safe to race upon.

A great deal of arcane regulation was invoked to distinguish between what did and did not constitute an event having taken place. This of course had commercial implications and determined various pay-outs to F1 as well as the points. Meanwhile the thousands of spectators who had stood around in the rain for several hours were left to trudge home having not

seen a race. Half-points were awarded for the order behind the safety car, meaning Red Bull's Max Verstappen was the official 'winner' ahead of Williams' George Russell, who had driven a stunning lap in wet qualifying the day before to go second-fastest, ahead of the Mercedes of Lewis Hamilton. This was the trio obliged to go through with the post-event podium ritual.

A notable misnomer from the qualifying order was seventh-place qualifier Sergio



A farce during Formula 1's Spa day: championship points were awarded after just a few laps behind the safety car, with conditions too dangerous to race in.

Right: Dutch support for Verstappen and Red Bull in Zandvoort was spectacular



Pérez, who had crashed his Red Bull on his first lap out of the pits on race day but was later able to join in the formation at the back. Lando Norris had crashed his McLaren out of Q3 through the Eau Rouge/Raidillon section, having gone fastest of all in both Q1 and Q2, and so was also at the back in his rebuilt car.

It was an enormously frustrating event for all concerned (with the possible exception of Russell and Williams) and FIA president Jean Todt vowed in the aftermath that lessons would be learned. "The weather windows predicted by the forecasters did not appear throughout the day, and while a small window did appear late in the day during which there was an attempt to start the race, conditions quickly worsened again.

"Therefore, due to the lack of visibility created by the spray behind the cars, we could not run the full race in sufficiently safe conditions for the drivers, marshals as well as the brave spectators who waited for many hours in the rain, for whom I am very sorry.

"The FIA together with Formula 1 and the teams will carefully review the regulations to see what can be learned and improved for the future.

"The findings, including the topic of points allocation, will be added to the agenda of the next F1 Commission meeting on October 5."

That wet weekend was made a distant memory just a few days later with F1's first

visit to Zandvoort since 1985. Verstappen mania was intense even though a cap of 70,000 spectators had been imposed by the Dutch government as a Covid precaution. Every single one of them seemed to be in full party mode for the entire weekend and it was extraordinary to see a nation get behind a single driver in such an intensely exuberant way. Orange smoke shrouded the track every time his Red Bull appeared, football stadium cheers went up every time he did a lap to put him at the top of the timing screens. So it was very fitting that he should go on to dominate an event that his own success had essentially brought into existence around the reconfigured seaside circuit. Lewis Hamilton's Mercedes kept the pressure on, but said afterwards he believed Verstappen,

**"Verstappen mania was intense, even with a cap of 70,000 fans"**



Verstappen was peerless in his Red Bull during Formula 1's first visit to Zandvoort for over 35 years

"Had just been toying with us. They were so fast this weekend."

The biggest challenge faced by Mercedes was getting its car to work through the sequence of Turn 2/3 - the latter the now

heavily banked Hugenholtz turn. The gradient of the banking is low at the bottom but rising up to 19 degrees in the top half. The fastest way was to go up high, with the outer wheels even beyond the white line, but the dynamics of the car in getting there were complex. If you were still scrabbling late on the exit of 2, you could not get

over to the ideal right-hand approach for the banking. Furthermore the Merc was repeatedly scraping its front wing endplate through the banking and there was a genuine question of whether the car's long wheelbase was proving a specific handicap. At no point in the weekend could Hamilton get anything closer than 0.18sec slower than Verstappen just through that short sequence. Which was the major chunk of the Red Bull's lap time advantage. That banking definitely played its part in the fairytale outcome for the Dutch fans.

Verstappen and Hamilton in their duel locked themselves into two-stop strategies while Valtteri Bottas in third set a more restrained one-stopping pace, a long way clear of the Pierre Gasly-led midfield battle in which the Ferraris and Alpines were



# The robots won't win

Automated wheel guns may have been the future, but the switch back to manual pitstop systems can misfire

Ferrari was the first to introduce 'intelligent wheelguns' around three years ago and many of the other top teams quickly followed. These 'smart' guns had software that runs a series of automated checks which, once completed, send an automated signal to the front jack man to release the car. Once the system has detected that all four wheels had been tightened, that signal would go automatically, and in doing so saving the human reaction time of the gun man. To arm the system, the gun man would press a button on the gun, which he would do in one movement,



even as he was still tightening the wheel nut.

The FIA felt that the super-fast pitstops were becoming too automated and earlier this year decreed that from Spa onward the button must be pressed manually after the nut had been tightened, thereby reintroducing a human element into that part of the operation.

If the button was pressed in the old way, before the nut had been fully tightened, the signal simply wouldn't go through as it should. It would be rather like the driver pressing his DRS button before the activation zone. They could do it all they liked, but ultimately nothing would happen from it.

This is what occurred on the right-front wheel of Max Verstappen's Red Bull during his Monza pitstop. By the time it was realised what had happened and the procedure was repeated to clear the system, 8sec had been lost. And with it went his chance of a win.



A pitstop disaster for Red Bull at Monza cost Verstappen a win, and set up his clash with Hamilton



also involved. The idea at Mercedes was to use Bottas to help put a strategic pincer on Verstappen, who was ensuring he was always just out of Hamilton's undercut reach. No matter what Hamilton tried, Verstappen had the speed in hand to answer and so was able to respond a lap later to Hamilton's first stop and still emerge ahead. This left the yet-to-stop Bottas in the lead and as Verstappen and Hamilton quickly closed him down on their fresh tyres, so there was possible opportunity for Bottas to delay the Red Bull and put Hamilton right on its tail. That is indeed what happened but Verstappen was able to make a clean pass on the leader at the beginning of the following lap. To the wild approval of the crowd, of course. From there he eased out of Hamilton's reach once more.

As Hamilton initiated the second stops still with half the race distance to go, he was put onto medium tyres. Verstappen was put onto hards as he responded the following lap. With his initially faster tyres, Hamilton was able to slowly reduce the gap, though he suspected Verstappen would have performance in hand. The Red Bull driver





Arguments for the safety improvements of the halo were settled many years ago, but once again its benefit was clear at Monza

Verstappen was triumphant on home turf at Zandvoort. Below: Bottas leads the Monza sprint



indeed stepped up the pace. Just as Hamilton's tyres began to fade. From that point onwards Verstappen was able to increase his lead every lap on his way to an historic victory, whipping the crowd into an orange frenzy. Hamilton made a late third stop, to at least take the fastest lap point. So close is this title contest, it could be decided on such small margins.

Just as Zandvoort made Spa ancient history so, a week later, Monza did the same to Zandvoort. The long straights were perfect territory for the lower-drag Mercedes, something confirmed in Friday qualifying when Bottas and Hamilton locked out the front row for the sprint race, 0.4sec clear of Verstappen. It was already known that Bottas would be taking multiple grid penalties in the main race on Sunday for a new power unit and associated changes. Which should have made the Saturday sprint race the perfect preparation for a Hamilton victory in the main event, by sitting him on pole.

## “McLaren secured its first victory in nine years and a 1-2 at that”

But it didn't work out that way. Hamilton made a disastrous wheel-spinning getaway on Saturday and was only fifth out of the first corner. Bottas led from start-to-finish, tailed throughout by Verstappen. Hamilton was unable to find a way past the fast-on-the-straight McLaren of Lando Norris and finished fifth, putting him fourth on the grid on Sunday, and behind two of those inconveniently quick McLarens. Verstappen would start from pole - which on the ultimate Mercedes circuit was a potentially hugely powerful swing in the championship.

But it didn't work out that way either. It ended up with Verstappen's right-rear wheel resting upon the halo of Hamilton's car in the gravel trap, the Red Bull's tyre actually pushing on Hamilton's helmeted head (thankfully the wheel was no longer turning). The net result of that collision allowed McLaren to secure its first victory in nine years, and a 1-2 at that, Daniel Ricciardo leading Norris across the line. But even without that incident, McLaren may

well have won anyway. Daniel Ricciardo - third in the sprint race and therefore starting second - out-dragged Verstappen off the line to lead. This was disastrous for Verstappen as the Red Bull was considerably slower than the slippery McLaren at the end of the straights. Verstappen could no more overtake it for the lead than Hamilton could Norris for third.

Actually, Hamilton had scrabbled ahead of Norris at the first corner and had then slipstreamed Verstappen up through Curva Grande and took a look around the outside into the Roggia chicane - only for Verstappen to hang him out over the kerbs. As Hamilton took to the escape apron and rejoined, so he was re-passed by Norris. He'd stay behind him all the first stint, just as Verstappen was trapped behind Ricciardo. The McLarens were seemingly impossible to overtake.

McLaren brought Ricciardo in from the lead on lap 22. He hadn't quite cleared Carlos Sainz's sixth-placed Ferrari but McLaren reckoned he'd be able to pass it immediately on his new-tyred out-lap. This is indeed what happened. Red Bull responded, instructing Verstappen to give

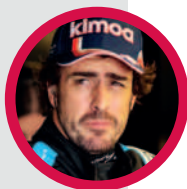


# Word on the beat

Driving violations, Alpine all-nighters, Alfa shuffles

● Asked by a fan when he first drove a car, **Yuki Tsunoda**, at Spa-Francorchamps, replied that he was eight years old, “a bit illegal in Japan”. An amused Fernando Alonso added, “Not only in Japan.”

● Has **Fernando Alonso** given up on racing at Indy again and winning the triple crown? “No,” he said. “In the future I will see. My challenges outside of F1 are still not completed, it’s just that my main challenge at the moment is F1.”



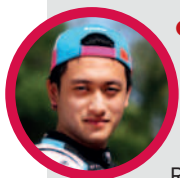
● **Esteban Ocon** revealed he did not get to bed at all in the aftermath of his Hungarian Grand Prix victory, as he celebrated with his Alpine team before heading to the airport the following day.

● After the non-race in Belgium behind the safety car, **Lando Norris** congratulated ‘winner’ Max Verstappen. “Fantastic victory. You were awesome today. I was catching you, though.”

● **Lewis Hamilton** on the events of Spa: “Money talks. Two laps to start the race was just so everyone gets their money. So I think the fans should get theirs back. I think the sport made a bad choice, doing those two laps. There’s only one reason they sent us out... I thought it a pity we couldn’t race tomorrow.”

● There is lots of speculation about who will fill the 2022 **Alfa Romeo** seat alongside new recruit Valtteri Bottas, given Kimi Räikkönen’s retirement.

Favourite is Chinese F2 front runner Guanyu Zhou, who brings a significant budget. Current incumbent Antonio Giovinazzi, who has outperformed Räikkönen this season, still has hopes of retaining his place.



Slippery and super-fast on the straights, Ricciardo’s McLaren may well have been unbeatable in Monza, even without the high-profile clash

it everything on his in-lap, in the hope that Ricciardo would be delayed on his out-lap. But Verstappen already suspected the ploy was doomed. As Ricciardo had stepped up his pace on his in-lap Verstappen had not been able to go with him. His tyres were shot. His flat-out in-lap was a full 1sec slower than Ricciardo’s had been – so he wasn’t about to jump the McLaren, even without the disastrous delay that was about to unfold in the pits.

The top teams use ‘smart wheelguns’ which have associated software and signals. Since Spa there have been FIA-imposed restrictions on these to make them less automated (see sidebar, p30). They now require a slightly different set of actions from the wheelgun man. This led to an operational error on the right-front of Verstappen’s car as he pitted, which cost him around 8sec. It was enough for Norris to overcut himself up to second. It was also enough for Mercedes to bring Hamilton in to take advantage.

Hamilton had not planned to stop so early. He’d been fitted with hard tyres, with all those around him on mediums. The plan

had been to run much longer, running in the lead for 13-15 laps after the others had pitted, then rejoin on brand new mediums just as they were on old hards. The numbers suggested he’d have been with Ricciardo, Norris and Verstappen by the end. Instead, after suffering his own 1.5sec delay in the pit, he exited just as Verstappen was bearing down fast on his out-lap. The Red Bull went

for the outside of the first part of the corner, with Hamilton marginally ahead on the inside. But it’s a switchback and so inevitably there was a point of potential contact where the feasible line narrows to a point. Verstappen had placed himself where it would have required Hamilton to move aside to avoid contact. He chose not to, the

Red Bull was thrown into the Mercedes, interlocking wheels, flipping Verstappen over the top of the Mercedes’ engine cover.

Amid the drama it went almost unnoticed that Valtteri Bottas joined the two McLaren drivers on the podium, having put in an impressive drive to third after starting at the back due to Mercedes taking an engine penalty. ●

**“Verstappen placed his car so Lewis had to move aside. He chose not to”**





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Release: 2022

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# Fine margins for overtaking

Passing at Zandvoort was no day at the beach, says **Mark Hughes**

Mercedes' attempt at using a two-stopping Lewis Hamilton and a one-stopping Valtteri Bottas to 'pincer' Max Verstappen's faster Red Bull in the Dutch Grand Prix was based around the calculated difficulty of overtaking around the tight Zandvoort track. According to team simulations, a lap time advantage of around 1.8sec would be needed in order to accomplish an on-track pass, which makes it the second-most difficult – after Monaco – on the calendar.

Verstappen took off from pole and immediately established an undercut cushion over the following Hamilton – i.e. his gap was big enough that he could pit a lap after Hamilton and still emerge ahead. Both were setting a hard enough pace to make it clear they were intending to two-stop. Bottas in third ran a gentler pace, with the intention of one-stopping. This was a deliberate split strategy from Mercedes, the idea being to use Bottas to slow Verstappen after the Red Bull had pitted and rejoined behind the yet-to-stop Bottas, allowing Hamilton to catch

up, creating a possible undercut chance up to the second stops. Red Bull was unable to counter it strategically, as Sergio Pérez had failed to make it out of Q1 and would be starting from the pitlane.

After Verstappen and Hamilton rejoined from their first stops on their fresh medium tyres, it took eight laps for them to catch Bottas on softs, which by then were over 30 laps old. The degradation rate of the soft was calculated by Pirelli to be 0.1sec per lap, so theoretically Bottas was lapping around 3sec off a new-tyred time. A new medium was around 0.7sec slower than a new soft but the degradation was much lower. Theoretically, Verstappen and Hamilton on their much newer mediums should have been around 1.5sec faster than Bottas – which, again theoretically, wouldn't be enough for Verstappen to overtake.

That's where the opportunity lay for Hamilton. With Verstappen bottled up behind Bottas it would allow him to erase the 2sec deficit to the Red Bull. As Verstappen

caught Bottas on the infield on lap 29, it did allow Hamilton to get right onto the Red Bull's tail. "Our concern at this point," said Red Bull's Christian Horner afterwards, "was that Hamilton would pit and undercut them both."

Red Bull was loath to surrender track position over Hamilton by anticipating that and pitting Verstappen – in which case Mercedes would have left Hamilton out long, ready to attack on newer tyres late on.

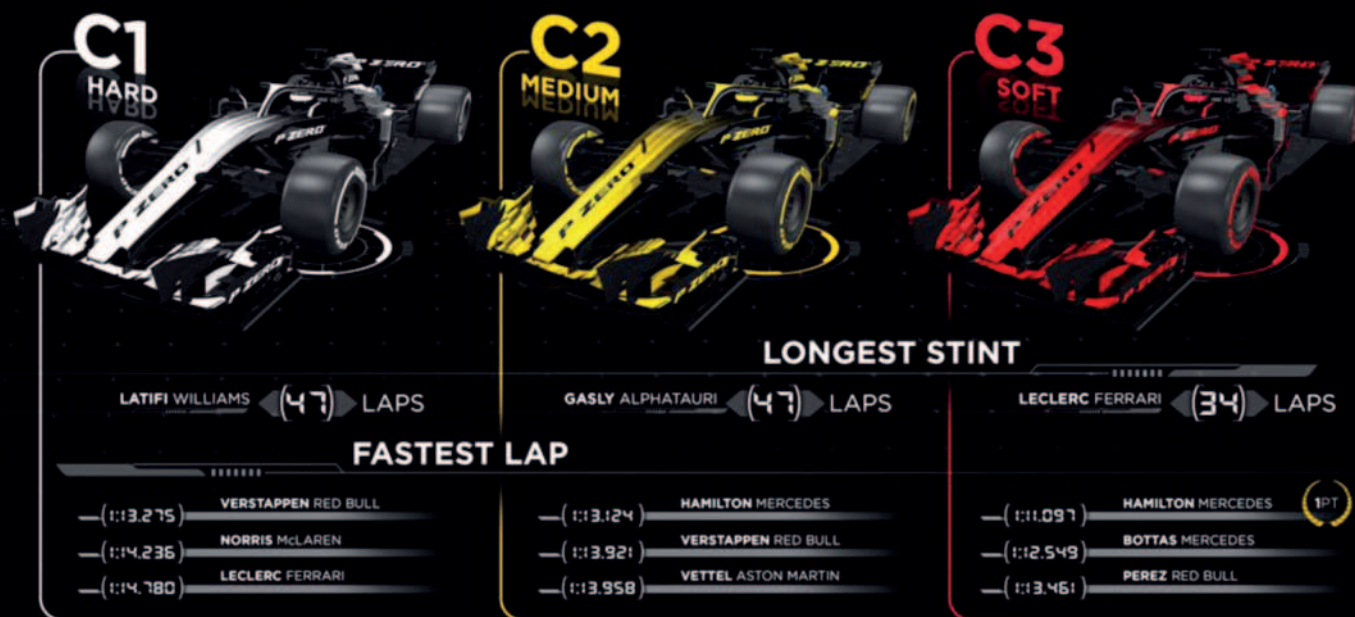
But Mercedes was reluctant to bring Hamilton in so early for his second stop, as it would have entailed a 42-lap stint to the end. Red Bull would have been able to give Verstappen an optimally-timed stop much later, giving him at least the 1.8sec margin he'd need to overtake by the time he caught the old-tyred Hamilton. Instead, Mercedes reckoned if Bottas could hold the Red Bull behind for long enough to get Hamilton to a slightly later second stop, they could do the undercut without the big tyre age offset to Verstappen later on.

So with neither team ready to commit to early second stops, it was now crucial that Bottas hold Verstappen off as long as possible. That 1.5sec tyre performance deficit he had might have been enough to allow him to stay ahead. But the Red Bull itself was around 0.3sec faster than the Mercedes around Zandvoort: 1.5sec + 0.3sec = right on the cusp of a pass. Bottas's 29th lap was a 1m 16.0sec. Verstappen's was 1m 14.3sec the lap before... It would be close.

It was decided as Bottas locked up his old front-left tyre slightly going into the Turn 11-12 chicane and got a poor exit out. It gave Verstappen the opportunity he needed to slipstream the Mercedes to Turn 13 and onto the banked final turn. He was pulling out of its slipstream and going faster even before DRS activation, which made it a done deal. The pincer had failed, ultimately because the Red Bull had that crucial extra 0.3sec over its rival.

## TYRE TACTICS

Pirelli's infographic for the Dutch Grand Prix at Zandvoort shows the lap time and life deficit between the three tyres, with the hard and mediums being almost too close to call. It was therefore tough to find the 1.8sec lap time advantage to make passing a sure thing.







# JOHNNY HERBERT

## “When looking at clashes like Max and Lewis, I always put my helmet back on...”

**T**HE MONZA WIN WAS MASSIVE for Daniel Ricciardo. His problems this year at McLaren were just starting to chew away at him and you could see he was thinking ‘what do I need to do?’

The weird thing is he’s been struggling with braking and Monza is the worst place for that! I actually think Lando Norris’s gaming background has been beneficial on this one. I never thought I’d say that, but Lando seems to have an extra sixth sense for when the car becomes loose and how it rotates in the braking zone, which I think comes from his virtual gaming. It’s taken Daniel longer to adjust in the real world, but good on him for sticking with it. It just proves, don’t give up.

It will be interesting to see how Lando deals with it now because suddenly he’ll have a team-mate on form and probably consistently so, which Daniel always was before. I’m sure Lando was thinking ‘dammit’ finishing second, but he is a team player. The biggest plus is for McLaren. There’s a long way to go for the team, but it did have a good car all weekend and it’s great to see that name back on the top step.

Aside from the McLaren feel-good factor, we also had the collision between Lewis Hamilton and Max Verstappen in Italy. When considering such moments I always put my helmet back on, so to speak. Max absolutely had a right to give that move a go. But under

braking going into that chicane as Lewis came out of the pits he’d have known there was a good chance it wasn’t going to work out. Max judged it beautifully as they turned into the right and there was a gap there at that stage – but when they were about half way between the right and the left that gap disappeared. Drivers don’t intentionally use the big orange sausage kerb inside the left-hander because, well, you can’t at that chicane because you know the car will bounce you off the line you are on – so you never touch it! – but he could and should have gone to the left of it. Watching it back, Max was turning right so far into the corner and Lewis was taking the normal line, as was his absolute right.

People say Lewis should have given him room – but why? Where has this mentality come from? From when I was karting, through the junior formulas and into F1, I never expected anyone to give me a corner – I had to earn it. A racing mentality is not to give space, it’s to give the least space you possibly can to avoid getting tangled up. Beside me on Sky F1 Damon Hill alluded to Max

perhaps thinking, ‘I’ll go in – if it doesn’t work out we’ll probably clash and we’ll both go off.’ There is that question, what Toto Wolff called a “tactical foul”, because he committed to a gap that wasn’t there. To me, the essence is to be hard but fair. Lewis was fair and so was Max – up until the point where he should have gone left and cut through.

The Silverstone clash was different in my opinion; both could have helped each other. On his occasion I can’t see how you can say that. Yes, Lewis could have turned right – but you’re expecting a driver to turn right when the corner goes left, to give space to the guy who hasn’t actually got room to get past? That’s Lewis’s fault?

I love Max and always have, from the moment he arrived in F1 at 17. I don’t want to dilute the way he races because I love that about him. But on this occasion I don’t think what he did was right. Also, look at what happened at the second chicane on lap one. Max squeezed Lewis, Lewis realised what was happening and cut the chicane. That was the right thing to do, and Max for me did nothing wrong with his squeeze. That’s racing.

Something that isn’t right is all these radio messages coming from drivers saying that ‘he squeezed me’, ‘he pushed me off’. They are all going back to and are intended for the race director, Michael Masi. I hate it. I sometimes wonder, with all these rules and the emphasis on track limits, whether one day someone will try and sue another driver for losing a world title. You’ll see an ad on TV: ‘Do you feel you lost the World Championship because someone took you off? Give us a call!’. I’ve said it before: on these written or unwritten rules for racing there needs to be a reset. **●**

**Johnny Herbert was a Formula 1 driver from 1989-2000 and a Le Mans winner in 1991. He is a regular contributor to Sky Sports F1. Follow Johnny on Twitter @johnnyherbertf1**

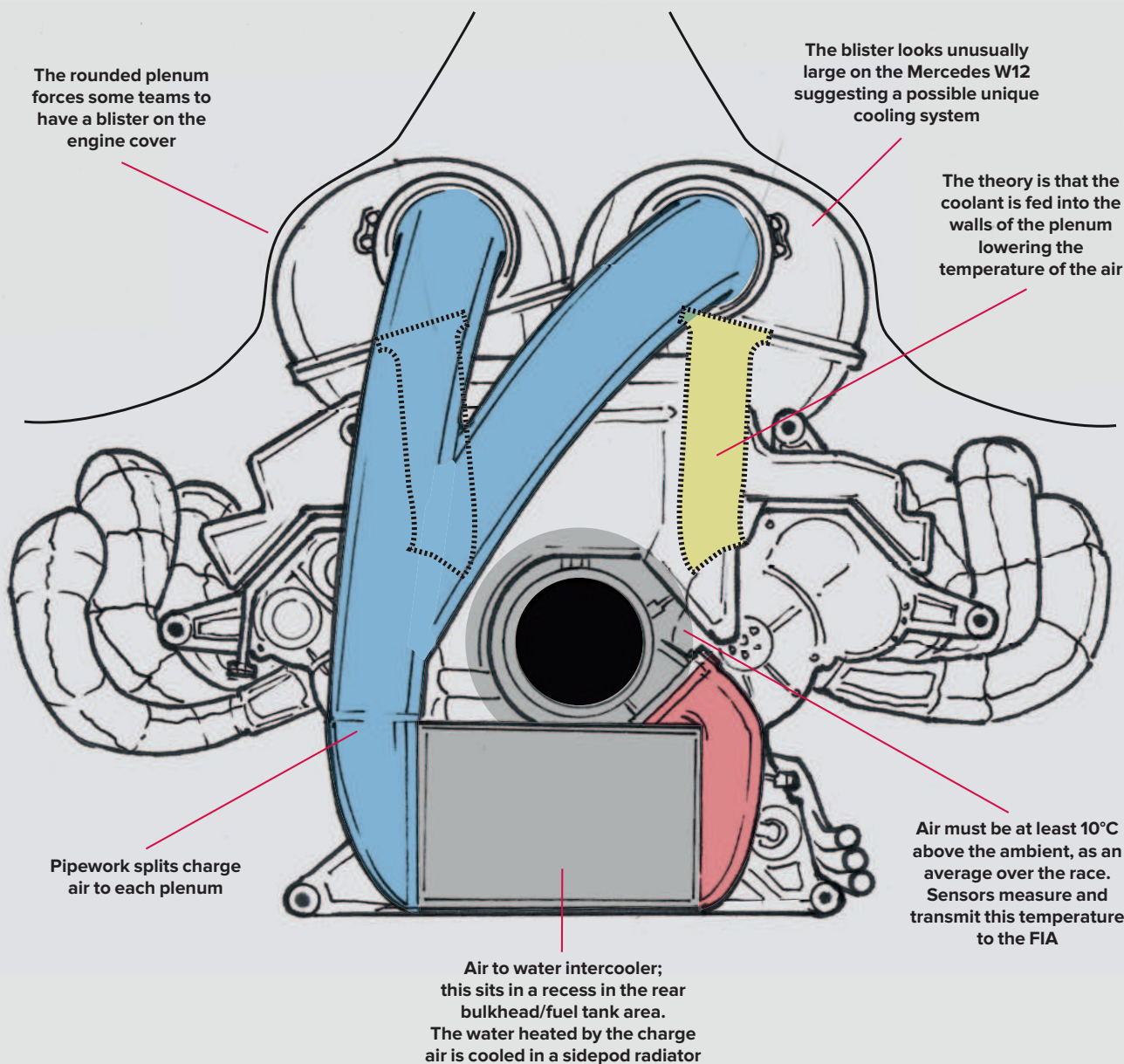


MOTOR SPORT TECH

# Time for a cool draught

Red Bull's tangential enquiry to the FIA hints at a possible clever method of briefly boosting power on the Mercedes engine

WORDS: MARK HUGHES ILLUSTRATION: CRAIG SCARBOROUGH





SOME TIME BEFORE THE BELGIAN Grand Prix, Red Bull submitted a query to the FIA regarding the placement of the heat sensors within the Mercedes power unit's intake plenum. This was initiated after Red Bull had observed from GPS traces that the Mercedes displayed occasional bursts of enhanced power under acceleration out of corners before then reverting to 'normal'.

Since the pre-season launch of the W12 it has been speculated that the unusually big plenum of the 2021 Mercedes PU (requiring a large blister at the side of the engine cover) has within it a unique cooling system which can be used to make the intake air denser and therefore more combustible.

The air enters through the airbox within the engine cover and is directed to the turbo's compressor (which, in compressing the air, has the undesirable effect of increasing its temperature a long way above ambient), then to the intercooler (to reduce the temperature again), the plenum, intake trumpets and finally the combustion chamber.

There's a technical regulation controlling the intake air temperature. It must be at least 10°C above the ambient, as an average over the race. Sensors measure and transmit this temperature to the FIA.

Obviously the closer the engine can be run to that regulation temperature limit, the more power it will be able to produce, but keeping it at or close to that average limit without going beneath it is no easy task in conditions which are forever changing. So the temperatures tend to be quite conservative. But if there was a way of taking advantage of any 'surplus' average built up by briefly introducing much cooler air - thus bringing the average closer to the permitted limit - it would give the sort of brief power burst which Red Bull had observed.

The theory is that the Mercedes has a system whereby a quantity of coolant can be borrowed from the main system, supercooled and fed into the walls of the plenum. These walls would have a maze of hollows and matrices to maximise surface area. These cooled walls would lower the temperature of the air travelling through the plenum chamber. But once that thermal transfer from the cool walls to the hotter, fast-moving air had taken place, the effect would be over and the no longer supercool coolant would be released

### **"Cooling the plenum on demand would be a powerful tool"**

back into the main system. It would though have given a brief burst of extra power and could in theory be repeated on demand.

Such a liquid-cooled plenum would give the sort of flexibility required to get closer to the permitted average minimum in variable, dynamic conditions. The cooling effect of the intercooler cannot be varied as required and has just a set effect. A plenum which could be cooled on demand - perhaps through software which recognises a pre-set combination of parameters - would be a potentially powerful tool.

A potential limitation to this theory is that the plenums are commonly fashioned in carbon fibre, which is a very poor conductor of heat. Getting the heat transfer from cool interior walls to the warmer (and fast-moving) air inside the plenum would require a good conducting material. A ceramic would be ideal but such materials are banned from the power unit by regulation. The Mercedes plenum appears to be made of carbon fibre, so maybe debunking the whole theory. It's possibly merely a carbon casing of a metal plenum, however.

There is nothing about such a system which would contravene the regulations, but this is F1 where competitive paranoia is rife - and occasionally justified. What if the temperature sensors were not in a place which would accurately record the wall-cooled air? This seems to have been the basis of Red Bull's query to the FIA.



Overhead view clearly shows the bulges needed to accommodate the Mercedes engine's enlarged intake plenums

"The FIA is regularly in conversations with the teams about technical matters," said a spokesman. "It's just part of the normal process."

Merc's technical chief James Allison said of the engine cover bulge at the car's launch: "There's been a big investment by our friends at HPP to redesign the plan of the intake system of the engine, re-tune the engine around that, and squeeze a lot more power out of the power unit as a consequence."

It has all added to the intrigue as Red Bull has sought to understand where its championship rival may be gaining an advantage. "We are happy that they are dedicating time to this type of research," said Merc boss Toto Wolff about Red Bull's query. "If they are distracted like this, that's fine. Their every request is welcome for us."

There is obviously a reason why the Mercedes plenum is so big. But whether it's this one is far from certain; it could indeed be that Red Bull is chasing a red herring. Which in the ongoing battle between the two entities adds an extra element. ○

Mercedes unquestionably hides a lot of tech secrets within its F1 W12







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# Good month, bad month

James Elson charts the ups and downs of the F1 circus

GOOD



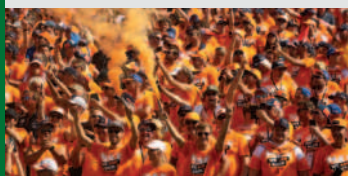
## VOMIT COMET

Woking is winning again. Those dark 2015 days of Honda engines letting go every five minutes seem long distant. Ricciardo's Monza victory meant we were treated to the sight of Norris looking distinctly green around the gills on the podium after accepting the dubious honour of a 'Shoe-y' from his teammate.



## NANDO'S WALL OF DEATH

Alonso put all his Indianapolis experience to good use by mounting the outside of the banked Turn 5 at Zandvoort to round his rivals – a move partly made possible by Jarno Zaffelli's genius reworking of the circuit. It might get even better next year: Ross Brawn wants drivers to use DRS on the banking.



## RETURN OF FANS

Whether it's the Oranje Army or the tifosi, it warms the cockles of even the grumpiest curmudgeon to see loyal F1 legions at circuits again. Can't wait to see all those passionate fans at Abu Dhabi!



## MR SUNDAY, AT LAST

George Russell, with a 2022 Merc contract in his pocket, out-qualified both Silver Arrows drivers to sit second on the grid at Spa while at the wheel of the second-worst car on the grid. Awkward...

## NIKITA'S GREATEST RACE

Who set the hottest 'race' lap at the 2021 Belgian GP? Why, Nikita Dmitryevich Mazepin, of course. The Moscow man bizarrely set fastest lap in the three-tour run round Spa under the safety car – the crowning moment of his F1 career?

BAD



## GIO'S HOME SPIN

The pressure's on, Gio – your place as Ferrari's Italian F1 driver mannequin is under threat. You need to convert your incredible Monza and Zandvoort qualifying efforts into valuable points! Uh-oh: botched pitstop + reckless rejoining of the track = same old story...

## WALLONIAN WASHOUT

We've lost count of how many times rain has been predicted this season and then never shows up. Then at Spa, when it finally does...



## HELLO JAMES, IT'S LEWIS...

After the calamity of Hungary, Mercedes dropped the strategic ball once again in Zandvoort, then bungled its Hamilton stop in Monza.



## F1'S 'BANKER LAPS'

Running the Spa race for just three laps conveniently triggered commercial agreements which meant everyone who mattered to F1 got their money. Not a great look for a championship that's cheerily promoted itself as being so inclusive and politically correct in recent years. Sentiment obviously doesn't extend to the treatment of its own fans.



## FIRST OF THE IDIOTS

Some of the drivers might also have felt ripped off. The top 10 at Spa were awarded half points. Those outside it got nothing. As Alonso put it, "I'm P11 – the first idiot, in a way. I was not allowed to fight, but they gave the points away regardless."



F1 RETRO – JULY 2008

## The F1 champion over the Hill

Extraordinary tales from the *Motor Sport* digital archive

IT'S 25 YEARS THIS MONTH SINCE DAMON Hill, after several near misses, finally stepped out of his father's shadow and claimed the drivers' title for himself in Japan – and prompted perhaps Murray Walker's most endearing piece of commentary.

Bizarrely though, it was his last race for a Williams team which he had carried through the loss of Ayrton Senna and scored 21 wins. There had been shaky moments for Hill, from allowing himself to be clouted by Schumacher at Adelaide '94 to T-boning the German at Silverstone the following year, and it was during 1995 that Frank Williams and Patrick Head lost faith in their lead driver.

This month's F1 Retro from July 2008 has Andrew Benson looking back at why it all went wrong, and talking to the protagonists.

"I went from Sports Personality of the Year to being a nasty smell," says Hill. "It was catastrophic. I'd already signed for 1996, but I think that's when Frank and Patrick decided: 'We've got to get someone because he's up and down like a yo-yo.' If they'd said: 'Damon, it's all over,' I think I'd have said, 'You're right!'"

"When I went down, I went down mentally, and it all got to me. The stress of '94 was immense, and I didn't manage to regroup."

For behind-the-scenes insight on the height of '90s F1 drama, there are few to match this.

To read the full story visit [motorsportmagazine.com/archive](https://motorsportmagazine.com/archive)





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# It doesn't get much better

With a soaring price tag, the BMW M5 CS should seriously impress. **Andrew Frankel** heads to Thruxton on a fact-finding mission

**B**MW is exerting upward pressure on the positioning of its M5 super saloon. When the previous model was introduced in 2011, it cost around £73,000. When it replaced the current car in 2018 that price had risen to £89,000. To this was added a Competition version, which was nothing of the sort, but it didn't take long for the standard car to be quietly deleted from

the configurator, meaning today the entry point to M5 ownership is £102,385. But BMW would far rather you bought this new CS (Club Sport) model instead, for which they would like £140,780, all but double the price of the only M5 you could buy a decade ago.

It's a vast sum to spend on a mass-market four-door saloon given that a 520i SE from the other end of the same model range costs - wait for it - over £100,000 less. BMW rather grandly

calls the CS a 'limited-run, exclusive special edition model' but then omits to mention to what number the run will be limited, rendering the phrase meaningless. My strong suspicion is that it will be limited to the number BMW expects to be able to sell, making it just like any other car on sale. Can it be worth it?

On the surface it seems not. Despite new intercoolers and revised turbos running higher boost, the power gain over the Competition is just 10bhp. Yes, this does make this the most powerful M car to date, but only just. Likewise the weight reduction of 70kg, primarily through the addition of forged rims, carbon ceramic brakes and some CFRP panels (of which the largest by far is the bonnet), though welcome, has to be seen in the context of a car that still weighs over 1800kg. Overall it equates to a drop in mass of less than 4%.

Perhaps more significant is what BMW has done to the suspension, which retains the old architecture but is otherwise thoroughly re-thought: new springs, dampers, anti-roll bars and more robust engine mounts to stop the car's single largest weight source from roaming around the engine bay, adversely affecting the handling. Pirelli P Zero Corsa tyres - street rubber with decent wet weather



Extensive use of carbon fibre has given a 70kg weight reduction over the M5 Competition



The interior features four M Carbon bucket-style seats; that's right – you lose a seat in the back

## “I was prepared to be thoroughly sniffy about this car”

performance but some degree of track optimisation – completes the picture.

I was prepared to be thoroughly sniffy about this car. On first acquaintance I didn't appreciate the unyielding M Carbon front seats, and upon looking in the back I noticed the one in the middle has gone, so this car is not even as practical as before.

And yet so too is there something different about this M5 CS. I felt warmer towards this generation of M5 than its predecessor from the moment I first drove one, but always thought a distance remained before it could possibly be mentioned in the same breath as those M5 icons like the E28, E34, E39 and E60 of times past. But the CS takes the single biggest stride along that path seen to date.

It's as if BMW has stopped play acting, no longer merely making a car that looks, sounds and goes like an M5 should, because if it doesn't drive like one, none of that matters.

This M5 drives like an M5. I don't really care that it requires just 3secs to reach 62mph from rest, I care deeply that it feels like a sports saloon developed by people who really understand what matters in this kind of car.

Which first, foremost and strangely enough, means it should ride properly. Cars

like this don't actually spend most of their time on mountain passes and race tracks; indeed many will spend none of their time in such idyllic environments. They'll slog up motorways and crawl through towns instead. And bizarre to report though it is, I'd say this M5 CS on its stiffened, lowered suspension actually rides better than the Competition.

When conditions are right it should more than merely go through the motions, gripping hard and behaving itself when the limit is reached. It should offer an involving, interactive experience, and this M5 does. Indeed I was surprised and impressed not just by its grip and balance, but the feel of the car. For the first time in far too long, I felt like an integral part of the process rather than being told to sit down, shut up and watch the show.

The most illuminating moment for me came when I used it as transport to Thruxton to drive the Jaguar XJR-8 that is featured in the V12 pages of this magazine. I thought it would be sensible to reacquaint myself with this fast and tricky track before tackling it in a 750bhp Group C car, so I padded round gently in the M5. Yet despite paying far more attention to identifying lines and braking points than driving fast, until someone driving a nearly

new Porsche 911 GT3 RS slithered past, it was the quickest car out there.

I really liked that, because not only should all M cars be even faster than they look, the reason for that speed should be the confidence they instil in the driver. That to me is another crucial M car trait, which certainly the larger, heavier ones of recent years have lost.

It still strikes me as a great deal of money, but for the first time in a decade an M5 is now the super saloon I would choose to drive. The Ultimate Driving Machine? In this category and for now at least the answer is yes. Welcome back M5. It's been a long time. **●**

### BMW M5 CS



- **Price** £140,780 ● **Engine** 4.4-litre, eight cylinders, turbocharged
- **Power** 626bhp at 6000rpm
- **Torque** 553lb ft at 1800-5950rpm
- **Weight** 1825kg
- **Power to weight** 343bhp per tonne
- **Transmission** Eight-speed automatic, four- and rear-wheel drive ● **0-62mph** 3.0sec ● **Top speed** 190mph (limited)
- **Economy** 25.0mpg ● **CO<sub>2</sub>** 256g/km
- **Verdict** This is the real deal – superb.



# Hats off, Hyundai

A young man's game but there's little to complain about

**Y**OU MAY HAVE ALREADY READ elsewhere some fairly breathless reviews of the new Hyundai i20 N. And if you have, you would be forgiven for concluding that it was the hot hatchback equivalent of the second coming. But what would the reviewers make of it if they, like me, had not just flung this little 201-horsepower shopping car along B-roads and around the track, but actually lived with it for a week?

You know what? They'd still love it. As Ford discovered with the Fiesta ST many moons ago, if you take a light, compact and fundamentally well engineered hatchback, give it some shove and put some capable chassis engineers on the case, great things can result. And this is precisely what Hyundai has achieved. A strong motor, a stiffened structure, firmer suspension and an electromechanical front differential is all you need to turn a worthy runabout into a terrifically fun small performance car. And the youngsters at whom it's aimed will love the



For all that this car has – five doors, 10.25in infotainment screen, great engine – you might say it's a steal for the price

mind-boggling amount of engine, chassis and stability system configurability it offers.

Yes, this middle-aged man would rather have more plush suspension, a taller sixth gear and a less raucous engine note, but that says as much about me as the car. I'd still prefer the Fiesta which has a more characterful engine and I'd judge would be gentler over a distance, but there really is little in it. It is a car of which its creators should be proud. **AF**

## HYUNDAI i20 N

- **Price** £24,995 ● **Engine** 1.4 litres, four cylinders, turbocharged, petrol
- **Power** 201bhp ● **Torque** 203lb ft
- **Weight** 1190kg
- **Power to weight** 167bhp per tonne
- **Transmission** Six-speed manual, front-wheel drive
- **0-60mph** 6.2sec ● **Top speed** 142mph
- **Economy** 40.4mpg ● **CO<sub>2</sub>** 158g/km
- **Verdict** The Fiesta ST has competition.

# Petrol's fond farewell

Before the Macan goes electric, here's a late fossil-fuel flourish



**T**HIS 'NEW' MACAN IS ACTUALLY the old Macan with some minor cosmetic upgrades, by far the most important being a more modern look to the interior, with far fewer buttons. Yet if you read the brochure you'll see that its engine has been given another 60bhp – surely that is significant?

Well, yes and no. Call it by its Macan GTS name, it's a genuinely big deal. But actually what you're looking at here is a car priced and powered like the previous Macan Turbo – dropped from the range – wearing GTS badging.

How so? Because the next Macan Turbo is over a year away and, like the Taycan Turbo, won't be turbocharged at all. It won't even have an engine, but electric motors. So this facelift of a car that's already been facelifted (and was itself based on the platform of the previous generation Audi Q5 which launched over a dozen years ago) is what is required to tide the Macan over until the genuinely all-new electric Macan arrives. After which the two cars will be sold side by side presumably for as long as

demand for the petrol-powered model remains. A base-spec Macan with 20bhp extra is included in the range but the Macan S is dropped.

Despite aged underpinnings, it's instructive to realise it's still the best car to drive in its category. Though it is heavy, nothing else like it is more involving or rewarding. In sales terms it is the most successful Porsche of all time, and there will be plenty more of those before the electric Macan calls time on its reign. **AF**

## PORSCHE MACAN GTS

- **Price** £64,770 ● **Engine** 2.9 litres, six cylinders, turbocharged, petrol
- **Power** 434bhp ● **Torque** 405lb ft
- **Weight** 1960kg
- **Power to weight** 221bhp per tonne
- **Transmission** Seven-speed automatic, four-wheel drive
- **0-60mph** 4.3sec ● **Top speed** 169mph
- **Economy** 25.0mpg ● **CO<sub>2</sub>** 255g/km
- **Verdict** Still a class-leading experience.





## EXCLUSIVE SIGNED MOTOR RACING AUTOMOBILIA, GUARANTEED

### Ayrton Senna 1991

1991 Brazilian Grand Prix 'clear visor', green interior, full-size display helmet.



### Nigel Mansell 1989/90

Ferrari 'deep visor strip,' full-size signed, display helmet.



### Michael Schumacher 1998

1998 Suzuka 'chrome' display helmet, hand signed visor with full COA



### PRODUCT OF THE MONTH

#### Nigel Mansell signed, full-size 1992 helmet

Full-size display helmet, full sponsor 1992 Williams, Formula 1 World Champion.

Following two years at Ferrari, Nigel re-joined Williams, winning the British Grand Prix in 1991 and the F1 World Championships in 1992 including the British Grand Prix, moving immediately to IndyCar and becoming the only driver to hold both Championships simultaneously.

This display helmet features a hand-signed visor, including 'best wishes' from Nigel and his signature 'Red 5', the helmet comes bagged with a photographic Certificate of Authenticity.



### Alain Prost Ferrari 1991

Ferrari full-size display helmet. Signed option. In stock.

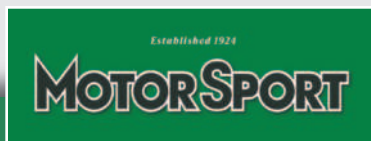


### Michael Schumacher 2006

Ferrari, final season, display helmet, hand signed visor with full COA



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American retro, from left: Breitling Top Time Shelby Cobra; Chevrolet Corvette; Ford Mustang

# V8 o'clock precisely

Breitling's new automotive-infused Top Time Classic Cars Squad watches pay tribute to the Mustang, Cobra and Corvette

**B**ENTLEY AND BREITLING SET A trend for collaborations between luxury car marques and high-end watchmakers when they teamed up in 2002, just a few months before the launch of the top-selling Continental GT and Bentley's return to Le Mans glory with the 1-2 finishes of the Speed 8 cars.

Drivers Tom Kristensen, Guy Smith and Rinaldo Capello (in winning car No7) and Mark Blundell, David Brabham and Johnny Herbert (in second-placed car No8) were issued with special Le Mans editions of a Breitling watch based on the existing 24-hour dial Navitimer Cosmonaute, originally developed for astronaut Scott Carpenter to wear during the orbital flights of Mercury-Atlas 7 in 1962.

The Le Mans special was the first variation on the Breitling for Bentley theme that began with the original Bentley Motors chronograph and grew to include numerous other models, among them the 6.75, the Bentley Perpetual, the limited-edition Mulliner Tourbillon and a rectangular-cased disaster called the Flying B.

The partnership became the longest known between a watch brand and a car marque. But following the sale of Breitling to investment group CVC Capital Partners in 2017 and the appointment of former IWC boss Georges Kern as CEO, some thought it likely that the Bentley deal would be axed - and now, after an

impressive 19 years, its demise has been officially announced.

Bentley's historic image as a maker of carriages for sporting, tweed-clad gentlemen couldn't be much further from Breitling's new direction as a watchmaker for a younger, funkier, 'woke' generation. It's an image the brand promotes through its 'squad' concept that draws ambassadors from the worlds of cinema, exploration, aviation and sport and collaborations with hip labels such as Deus Ex Machina, Outerknown and Ironman.

The appreciation of retro-cool is also central to Breitling's message, and that has now manifested itself in three new automotive watches in its Top Time chronograph range, each paying tribute to a '60s American car.

The Classic Car Squad watches comprise a red and black dial version dedicated to the Chevrolet Corvette; a green and brown model inspired by the Ford Mustang and a blue one based on the Shelby Cobra. Each is a variation on the existing stainless steel Top Time (itself a tribute to one of the maker's most popular '60s pieces) and is powered by Breitling's chronometer-certified Calibre 23 movement.

The snap-on back of each watch is engraved with the respective car's logo, and the calfskin leather straps are perforated in 'driver' style. *Breitling Top Time Classic Cars Squad chronographs, £4360. [breitling.com](http://breitling.com)*



ATELIER JALAPER IS A BELGIAN MAKE THAT is following in the path of REC by offering watches featuring dials hewn from the left-over components of interesting cars. In this case it's the bonnet of an Aston Martin DB5 that has been used to create 600 dials for the four-model range, comprising date and day-date versions. The guilloché or 'engine turned' finish in the cut-outs at 12 and six o'clock is based on the look of a DB5 radiator grille, while transparent case backs give a view of the Japanese Miyota self-winding movement. *Atelier Jalaper AJ001-S, £690. [atelierjalaper.com](http://atelierjalaper.com)*



MOTO CULTURE IS A NEW BRAND THAT celebrates the fire-breathing, banshee-wailing 500cc two-stroke GP bikes that scared riders and thrilled crowds at race tracks in the 1980s and '90s. The inaugural Heritage Racer is available in six colour combinations that recall Honda's NSR500, Yamaha's YZR500 and Suzuki's RGV500 as well as the men who tamed them, including Freddie Spencer, Barry Sheene and Wayne Rainey. Each has a 40mm steel case containing a Seiko quartz movement. *Moto Culture Heritage Racer, £299. [motoculture.co.uk](http://motoculture.co.uk)*

**Precision** is written by renowned luxury goods specialist Simon de Burton





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Autumn racing at Goodwood for the 78th Members' Meeting – which has already sold out



## Full beam ahead

You're too late to buy tickets for the delayed Goodwood Members' Meeting, but you can still see the action online

78th Goodwood Members' Meeting, October 16-17

**T**HE RESCHEDULED 78TH Goodwood Members' Meeting is now set for mid October and as always there will be a great deal of racing to view. The delay – the weekend was originally scheduled for May – has meant that this year's edition has been highly anticipated, and after the easing of restrictions fans can now get close to the unsilenced races – that's if you already have a ticket. Admission is sold out, but you can still see all the action on live stream.

Following on from the triumphant returns of the Festival of Speed and Revival, Goodwood sees out the year with the traditional Members' Meeting after more than a year's absence from the calendar.

Demonstration runs, qualifying heats and races are a real highlight of the UK's motor sporting schedule, alongside Goodwood's other offerings.

Starting on Saturday at 9am, Goodwood will stage qualifying events to whet the appetite. Additional demonstration runs will keep attendees busy throughout the afternoon before live music and firework displays take you into the night.

Sunday's schedule is set to feature the majority of the races and provide a second chance to catch a few more demo runs in case you missed any on Saturday.

The free Goodwood Motorsport app makes it easy to keep track of the ongoing action as well as navigating around the grounds to make sure you don't miss a single minute of racing.

Saturday's events close at 10pm, and Sunday finishes at 7pm. The whole event is broadcast live via Goodwood Road & Racing for members of the GRRC, which includes an option for a no-commentary stream so you just get the sound of the cars.



Most races take place on Sunday, and Saturday's demonstrations are repeated

### GRAND PRIX OF THE AMERICAS – MOTOGP

October 1-3

The rescheduled MotoGP calendar means that the visit to the Circuit of the Americas now happens at the beginning of October. Yamaha's Fabio Quartararo has been the dominant force all season, but El Diablo has never won in Texas.

### RALLY FINLAND – WRC

October 1-3

The World Rally Championship faced a severely depleted calendar last season as a result of the global pandemic but the hugely-popular Rally Finland is back on the schedule. 2021 has largely been dominated by Sébastien Ogier and the Toyota Gazoo Yaris, and the Japanese marque has won the previous three outings of Rally Finland.

### TURKISH GRAND PRIX – FORMULA 1

October 8-10

Last year's Turkish Grand Prix was the scene of one of the most chaotic races of the year as Lewis Hamilton claimed victory and his seventh world title. Hopefully this year's race can provide as many thrills with the title fight heading into the final stretch.

### BTCC ROUND 9 – DONINGTON PARK

October 9-10

The penultimate round of the 2021 BTCC season takes the championship to Donington for the first time this year. Ash Sutton, Colin Turkington and Dan Cammish each took victory there last season.

### ISLAND X-PRIX – EXTREME E

October 23-24

Extreme E's inaugural season stages its penultimate round in Sardinia for the Island X-Prix. The first half of the year was dominated by Rosberg X Racing but Lewis Hamilton's X44 team has kept close company in the championship so far.

### MORE EVENTS

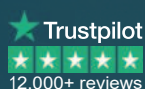
October 3 World Superbike, Portugal GP

October 10 NASCAR, Charlotte

October 15-17 British Superbikes (final rounds), Brands Hatch



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## A study in scarlet

Can a complete catalogue of every grand prix Ferrari make for a readable volume? This one does, says **Gordon Cruickshank**

**A** DAUNTING TASK, DESCRIBING every F1 Ferrari, yet Stuart Codling manages to make his list of every model of grand prix contender (to use a phrase which avoids a definition clash with the Formula 2 years) that Maranello has fielded a much more readable project than you might think from the title. Inevitably only a few pages can be devoted to each model, not a great deal to work with, yet he gets the story and the context of each machine neatly packaged with a decent selection of photos. Bold typography helps you navigate among the model years, and a simple spec table for each sums up the metalwork.

The text is necessarily concise yet doesn't feel cramped, giving the origin of each device, all its drivers and how it performed, good or bad. Ferrari politics and background earth tremors aren't left out: beginning the 1960s chapter, Codling says, "Enzo [inset] ceased to attend races following the death of his son Dino. Into this vacuum crept those who would exploit Enzo's absence for their own ends, selectively filtering information back to him as he



directed the wider operation from his Maranello office." That's a set-up line worthy of the best TV drama.

He also neatly outlines earthquake events such as the 1961 'palace coup' and the Spygate affair when Ferrari drawings made their way to McLaren. Thus it serves as a running history of Ferrari in a condensed way. There are a few diagrams to augment the photographs, mainly about front suspension design, plus a list of every Ferrari result up to 2020.

Turn over the pages rapidly and it's almost like a flicker book, watching the scarlet cars morph from the pudgy 125 through the drama of the 156 and the swelling curves of the 640 into today's ludicrously exaggerated, chillingly efficient and frankly ugly missiles. Was the F2002 the last clean-limbed, decent-looking Ferrari? Designers like to use the phrase "If it looks right, it is right". Which only proves that designers aren't always right.



**Ferrari Formula 1 Car by Car – Every Race Car Since 1950**

Stuart Codling  
Motorbooks, £40  
ISBN 9780760367773

## THE IROC PORSCHES

Matt Stone

Conceived as a TV package, the International Race of Champions (IROC) intended to pit Indy (USAC), NASCAR, Can-Am and F1 drivers together to establish an overall 'best' among disciplines. Though a good promotions package, the first 1973/74 season promised something that didn't carry through. Never again would the grid feature the likes of Fittipaldi, Donohue, Hulme, and AJ Foyt. Nor did the car choice last – it began with 15 identical factory-built Porsche RSRs in different colours, possibly the best-matched one-make machines ever. A shame that despite being an early TV success, with Jackie Stewart a star presenter, IROC declined into a sort of NASCAR featuring Camaros, Dodge Daytonas and Pontiacs before withering away.

Stone's book is about those IROC cars, their four races and the men who drove them. Yes, just four races, but Stone has plenty to tell us about these drivers (Donohue was the series star), the men behind the series including the far-sighted Roger Penske, and histories of the cars. Smartly designed and sparkily written, it's a fine tale of a great idea. Heat winner George Follmer writes the foreword; it sounds as if he loved it. **GC Motorbooks, £45.**

ISBN 9780760368251

## FIAT IN MOTORSPORT SINCE 1899

Tony Bagnall

Fiat has been competing since it was F.I.A.T. and that's some 120 years – not bad for a company whose main business is building small family cars. The badge has graced grand prix cars, rally winners, record cars, one-make series and by extension a host of 'etceterinis' – countless devices with Fiat bits. Bagnall works through all of these from what he titles the Heroic Age and the Glorious Twenties to the multiple Rally championships, with diversions to record cars and those lovely 8Vs, and includes the AAC 815, Enzo's first-born, for its Fiat parts. It's quite a lesson see the marque's achievements gathered together. **GC Veloce, £35. ISBN 9781845851859**

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## LETTERS

The changes to Formula 1 pitstop regulations to reduce the possibility of cars re-joining with a loose wheel are clearly well-intentioned and if effective are to be applauded. However, I believe much greater change is needed in the whole process. For years I have thought that the size of crews is not only potentially dangerous but frankly ludicrous. Why do we need a 20-plus crew swarming over and around a car simply to change four wheels?

In the new era of cost caps, what possible justification can there be in spending hundreds of thousands on purchasing and shipping highly specialised equipment and drilling large crews?

The six IndyCar mechanics allowed 'over the wall' can change tyres, refuel and make wing adjustments in 8sec - and all without excessively expensive paraphernalia. OK, it's not sub-3sec and fuel flow regs dictate the time of a stop, but who cares? It's every bit as exciting (I think more so) having a clear view of one mechanic on each wheel and with air jacks, and the front jack man is taken out of the firing line. Safer, cheaper, improves the show!

BRYAN JARVIS, GREAT BOOKHAM, SURREY



Another spectral racer – the ghostly white Parnelli/Interscope-Porsche VPJ6 of 1980

I read with interest your piece on 'ghost racers' in the October issue [*Born not to run*], as we have just acquired one. In 1974 John Barnard replaced Maurice Phillippe at the Vel's Parnelli Jones team. Barnard redesigned the VPJ4 F1 car, which led to the development of the VPJ6 Indycar, of which two were modified by Ted Field's Interscope Racing for Porsche and Parnelli's entry into the 1980 USAC series, to be driven by Danny 'On the Gas' Ongais.

An intensive testing programme at the Ontario Motor Speedway followed, before USAC, after vigorous lobbying by AJ Foyt reduced Porsche's turbo boost restriction, effectively making it uncompetitive. Sadly, this led to the shelving of the project, by Porsche, just a month before the start of the season.

DAVID BAINES, DIRECTOR,  
CARS INTERNATIONAL HERITAGE

I can confirm Frank Wells' comments [*Letters, September*] on the notorious flat in Adrian Court, Pinner Road, Harrow where so much happened both socially and businesswise in the embryonic Williams Grand Prix's formative years. I am a native of Harrow and raced with

Frank and Jonathan Williams in Austin A40s in 1962 and knew both of them well even before Frank turned up at what was Charles Crichton-Stuart's flat originally, until Charles got married to Shirley Anne Field and moved out, passing the rented flat on to Frank.

We had parties there on many Saturday nights and all sorts of unseemly goings on with motor sport celebrities attending, among others Jochen Rindt, Piers Courage, 'Bubbles' Horsley, Innes Ireland and many more. The building still exists but is more scruffy now than back in the day. It really should have a blue plaque.

Our family garage was nearby, and to the dismay of my poor father was utilised by many of the residents of the Pinner Road flat and other racing notables including Steve Soper whom we sponsored in the early days, Gerry Marshall and Dave Brodie.

ROGER BUNTING, BOVINGDON, HERTS

As one who respects Mark Hughes' F1 writing, I must take issue with what I thought was a rather disrespectful column on the passing of Carlos Reutemann [*Formula 1, September*]. He was at times an enigma, moody and sensitive, but he was one of the most gifted drivers of his generation.

As Mario Andretti so aptly put it, "Carlos was an uncrowned champion. I know how good he was. He was my team-mate at Lotus." Carlos ranks among the top of the shortlist of the great drivers not to win an F1 title.

The thing that bothers me is that in 1980 when he had a big lead in the title chase, his Williams team failed to get behind him. For example, they inexplicably changed tyre manufacturers on him mid-season, which did not suit Reutemann. This was a part of the

culture at Williams, where they never backed Carlos when he needed them most. It was Alan Jones' team and a British one at that, and Carlos was always the outsider. Frank Williams and Patrick Head now say they should have treated him better. I believe they're right, and the result might have been different on that day in Vegas when Carlos sat on pole and 'mysteriously' backed up to finish behind Piquet and lose the title by one point. We'll never know, but this part of the story needs to be told.

STEVE ANGELL, GLENVIEW, ILLINOIS, USA

Finally a well-rounded (pardon the pun!) story about Carlo Chiti [*Uncovering the lost genius of Uncle Carlo, September*]. Recollections by star drivers tend to make him come off as a sort of mercurial clown. Colourful as he was, there just had to be cerebral agility at work in a man with his résumé. I am pleased that Paul Fearnley has written such a much-needed perspective that should fill in the gaps regarding Chiti's reputation. A terrific read.

ANDY EVANS, ESCONDIDO, CALIFORNIA, USA

Events of the Belgium GP led me to recall a piece DSJ wrote many moons ago about the German GP. He was disenchanted with the race he actually witnessed and wrote a mildly satirical article describing the German GP he would like to have seen take place. It was brilliant and so memorable I can still recall it now! We all agreed with his inferences.

With the Belgian disappointment (I agree with the race not going ahead on safety grounds, but think it disingenuous to manipulate a result for commercial reasons especially when it was done so transparently), it would be great if *Motor Sport* wrote a hypothetical account of the race had it gone ahead. Leclerc coming through from last on the first lap to win after five changes of tyres, perhaps?

Regarding the future of the GP at Spa I am firmly in the 'it must continue' camp. Let's move the barriers back at Raidillon; it's the finest circuit on the F1 calendar. I'd be happy to contribute to a crowdfunding page if that's the only way to ensure its future.

RICHARD KEMP, VIA EMAIL

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SCAN ME





*THE MOTOR SPORT INTERVIEW*

# André Lotterer

Despite Audi and BMW's much-publicised exit from Formula E, the German-Belgian driver and three-time Le Mans winner remains one of the biggest supporters of the series. We speak to the Porsche devotee about his career so far



**A**NDRÉ LOTTERER HAS A HUNCH he might be the most experienced single-seater racing driver in history, despite his record including just one solitary Formula 1 grand prix start. He must be up there. For much of the past two decades, the 39-year-old has juggled a colourfully diverse dual racing life, consistently logging race starts and miles in open-wheelers while also becoming one of his generation's greatest endurance sports car racers. Born to a Belgian mother and Peruvian-German father who ran his own racing team, Lotterer remains an open-hearted car nut with an unquenchable thirst for speed and power.

It's somewhat ironic, then, that this modern-era racer with a cheeky old-school twinkle in his eye should find himself scrapping around pop-up street circuits in the suffocating, constricted world of Formula E, the all-electric single-seater series that remains contentious and a point-blank turn-off for so many deep-rooted enthusiasts. Formula E hasn't been kind to Lotterer so far. In four seasons, two for DS Techeetah and two as a member of the factory Porsche team, he's yet to win a race. In the most recent campaign he finished a lowly 17th in the standings after a season that featured too many clashes with rivals - although he's far from alone as a driver of vast experience who regularly finds himself embroiled in controversy, in a series where contact is not only unavoidable but even part of the game.

Still, he's committed for another season alongside Pascal Wehrlein and insists it's a challenge he relishes. *Motor Sport* caught up with Lotterer before the London ePrix in July - two days before another controversial collision, with António Félix da Costa - where we found the three-time Le Mans winner, 1995 Junior Karting world champion, 2011 Formula Nippon champion, 2012 World Endurance champion and enthusiastic amateur photographer in typically ebullient mood, happy to talk us through his racing life. And despite his focus on Formula E, he also made it clear he's far from done with the race he remains most associated with and for which he still harbours a burning ambition when a new era begins in 2023: to win Le Mans in a Porsche.

**Motor Sport:** At this stage of your career, what do you get out of Formula E?

**André Lotterer:** "Formula E was a refreshing new challenge after all the previous challenges I had. It's the first time in my career I've really been able to race with a purpose. Motor sport

was always a platform for manufacturers to showcase their new technologies, especially at Le Mans, but everything changed very quickly [when Audi and then Porsche pulled the plug on their LMP1 programmes at the end of 2016 and 2017 respectively]. Thanks to Formula E we race against climate change and represent the race of the future. We also always bring racing to people in the cities, which is something completely new. For me, it was really cool to join Formula E with this new challenge. To be honest, it's the biggest challenge I've had so far in my career, even compared to Le Mans: racing in the cities, not being able to practice there before, poor asphalt, just one line, any mistake you are in the wall, the energy management, everyone on the same level. You really have to be able to cover everything. Also I've never spent so much time with engineers, to develop the software in a smart way. In terms of a challenge, that is what still gives me the kick."

## "Formula E is the biggest challenge I've had so far in my career"

**M** Other drivers talk about the intensity of Formula E. It does seem to be one of, if not the most, intense forms of motor sport because you have so much going on in a race.

**AL:** "Yes, definitely. At the beginning when I was watching it while I was racing in other series I didn't really get it. I was pretty happy racing at Le Mans in LMP1, driving at 350kph. If you are not involved you don't understand. But then I got involved and it was eye-opening. I asked a friend at the beginning, 'How do you get excited on the grid? There's no sound, the lights suddenly go out and you

go.' My friend told me, 'I get the same goose bumps I did when I used to go to F1 races.' How? But now I get it, because the races are so intense. On the grid, even though there is silence, the drama is building up. I see it with my family, when they are following it on TV like never before in my whole career. You've seen the races: they are unpredictable, there's drama. In terms of the show, it offers a lot compared to other series. That is what people like to see, regardless of it representing electric mobility. Simply, the competition is very intense, which is essential to any sport. In other categories if always the same guys are at the front it's not as exciting."

**M** Some might first remember you in the UK from your year in British Formula 3 at Jaguar's junior team, formerly Paul Stewart Racing. What are your memories of that 2001 season?

**AL:** "It was a very important time for me to grow as a professional driver. I remember coming to the UK and thinking I was speaking English. I'd been racing in German F3 before and the first half of the year I didn't understand what the mechanics were talking about, the jokes and so on. Then suddenly it clicked and I grew into it. I learnt a lot that season, the competition was very tough [he won just once, at Donington Park, and finished seventh in the points as Takuma Sato claimed the title]. It was an essential step in my career. I could have stayed another year in Germany and benefited from the experience I had in my rookie season, but I had the opportunity to come here - and in parallel I was able to do more than 20 test days with the Jaguar Formula 1 car."

**M** You were on the path to F1. What happened?

**AL:** "There were a lot of management changes at Jaguar. The people I established myself with at the beginning had a plan for me to go from F3 and F1 test driving to F3000, then support me into an F1 seat. But they were not there any more. The management changed twice, and they had different interests - and friends, I guess! They put different people in and the dynamic changed completely. We were supposed to get a shootout to see if they would keep us. But in hindsight I think they had it all pretty much planned out with different intentions. Regardless of whether I was doing well or not, I had to look for something else."

**M** Jaguar spat out a lot of good drivers at that time, didn't they?

**AL:** "Yes. When I joined it was under Wolfgang Reitzle, then he left. Then it was Neil Ressler. Bobby Rahal supported me when he came in and asked me to do a lot of testing, so that was good because I could show myself in F1. ○



Jaguar's F1 test driver pictured before the launch of the R3 in 2002, but Niki Lauda stymied his opportunities





Focused at the 2021 Formula E opener at the Diriyah ePrix; he'd finish the season in 17th



Lotterer scored three wins in the German F3 Championship in 2000 for BS. Above, a third victory came at Le Mans in 2014 alongside Marcel Fässler and Ben Tréluyer





Of the seven races in the 2010 Formula Nippon, Lotterer notched six podiums but finished the season second to João Paulo de Oliveira



I was doing good times and the team liked me. It was looking promising. But then Bobby left and Niki Lauda came in, and he just had different drivers he was interested in. I'm just one guy, there are hundreds of drivers with similar stories about trying to make it in F1."

**M** You went to Japan - and stayed there for more than 15 years. How did that happen and what does that country mean to you?

**AL:** "It means a lot. It was a completely unknown territory and challenge for me. How it happened was that I was coming to all the F1 races and became good friends with Eddie Irvine. Enrico Zanarini was his manager and he hooked me up in Japan, because Eddie had raced there and still had that link through friends. Enrico got me a test at Nakajima [the team run by former Lotus F1 driver Satoru Nakajima] and I said OK. I wanted to stay in single-seaters and in Europe that was not really something I could have done because I had zero sponsors. I had to find something sustainable. It happened in February 2003, quite late for that season. Robbie Kerr was

supposed to get that seat and then he didn't. Ralph Firman Jr had gone to F1 [with Jordan], which is why it was open. They set up a test, an audition. The team said pack your stuff for two or three months because if you get the job you'll stay. So I told my girlfriend there was good news and bad news... I got the seat and I stayed five or six months. I started on a very humble deal and established myself from the bottom up. But it was a great opportunity to establish myself professionally in this world, with really good teams and racing fantastic cars.

"I was living at the core of my passion, racing Super Formula [Formula Nippon] and Super GT. Great race tracks, great racing, a fun environment. The atmosphere between the foreign drivers was good and every year it was getting better. Every time I signed a one-year deal, for 15 years. So the first three years I was with Nakajima, then I got approached by different teams and played my way up with a better salary. TOM'S got me into its team and

said, 'Come and live in Tokyo, it will be more fun.' I made a lot of friends and all the way along there was nothing in Europe that could have been better. I did a few DTM tests and got offered a seat, but I thought, 'Nah, I prefer to still race formula cars, this is awesome.' Also driving these super-fast cars really refined my skills. There was tyre development too, so it just kept getting better year after year.

"Some of the guys like Ben Tréluyer were also racing at Le Mans and they said, 'You should try it.' The only thing I was looking up to was when I saw these guys racing for Audi: that would be cool, I thought. I don't know, the stars lined up and

I went to do a race in 2009 for the Kolles team [which ran a privateer R10 turbodiesel]. It went well, then the works team took me on. That was my step through a big door back to Europe and the world sports car scene with a parallel programme. I was supposed to stop in Japan in 2012 when the World Endurance

**"Japan is not for everyone but I liked the motor sport passion"**



From left: Lotterer, left, at Suzuka in Formula Nippon, 2003; CART 2002 with Dale Coyne Racing; the Porsche man hitting speed in the 919 at Le Mans, 2017





The first of three wins at Le Mans came in 2011 in the turbocharged diesel Audi R18

Championship started, but I loved it so much I asked Audi if they were OK for me to do both programmes so long as they had priority. My Japanese teams said it was OK if I missed a race, so I managed to do both. I had a really awesome time just doing what I wanted to do.”

**M What a life!**

**AL:** “But Japan is not for everyone. I embraced it. I arrived and I was super-curious, and I liked the motor sport passion. I was playing *Gran Turismo* with all these cars and when I arrived there they were for real: the Honda NSX and Toyota Supra, iconic cars from the games. The first year I was just there for Formula Nippon, but the NSX was in the workshop. I pushed so hard to drive it, so they swapped the driver for me for the second half of the year and I had a seat in both categories. It was a fantastic experience. Also you are on your own and you have to figure things out, learn another culture and a very interesting one, too. Also in the teams, I had to take responsibility to set up the car myself. It was very cool.”

**M You were leading this dual life and you established yourself at Audi in one of the great**

**sports car driver partnerships with Benoît Tréluyer and Marcel Fässler. What was it about the three of you that worked so well?**

**AL:** “When I first got to Japan and went for that audition at Nakajima, Ben was there supporting Sébastien Philippe, who was his friend. Because I speak French we were friends from the first day, even though we raced against each other all those years. We used to say it would be so cool to share a car, we didn’t care who was better than the other: we just had fun, had a good life and were good friends. Then we had the luck to get together at Audi, and Marcel came along, who was a long-time friend of Ben’s from their Formula Campus days back in France. It was just one of those friendships that needed no effort. We were just living the dream, so thankful to be racing these cars. We were just having fun basically. We didn’t have to try, it was a natural dynamic. Because we were friends first we respected each other and were not trying to beat each other, and we’d cover for each other if on one day one of us wasn’t on it... Also with our engineer Leena [Gade] it was a good energy. We could be professional, but at the same time have a lot of fun and do it right.”

**M In a recent interview with Leena [Motor Sport, July], she told us you all had a sense of honesty with each other, saying exactly what you thought without it becoming personal if it ever got heated.**

**AL:** “Yes, we knew each other’s strengths and weaknesses but not in a critical way. It was also not easy for Leena to be in the team as a woman. There was competition between the engineers. For her to gain respect was something new for the team. They gave her that challenge [of engineering us] and we quickly proved ourselves. We needed to manage her as well - normally the engineer is managing us psychologically. There was always this dynamic of managing each other. Ben knew me like a little brother for 10 years, so he knew me inside out and contributed to my success. He was more technical in the setting up of the car. Honesty was definitely an important part of it.”

**M You had that wonderful purple patch, winning Le Mans three times out of four between 2011 and ’14. That first year, you were very much the third car as the juniors and the weight of expectation landed on your**



*shoulders when the other two crashed out. What are your memories of that 2011 race and the impact it had on your career?*

**AL:** “It was a big day for us. The build-up was in the year before when we had no shot of beating the Peugeots because they were so much stronger, but they broke [Lotterer and co. finished second in the Audi R15 to teammates Mike Rockenfeller, Timo Bernhard and Romain Dumas]. We were getting more confident. The team was still relying so much on Tom [Kristensen], Allan [McNish] and Dindo [Capello] but we were establishing ourselves. The momentum came gradually. I made a few mistakes that year, but the team kept me on. Then the R18 came out and I flew to Homestead in Florida with Tom to test the car for the first time. It was mega, it fit me like a glove and gave me that extra confidence to play and do anything with the car. Spa came, we didn’t have a good result, but if you read between the lines the speed was there – at the Le Mans pre-test also. It felt like we had momentum, but still we

were the underdogs because we had legends at the team you could rely on.

“When the accidents happened it didn’t change so much for us because we were focusing on trying to win the race and the opponents were Peugeot. For the team it was difficult, but for us inside the car it didn’t change so much. It doesn’t matter if you do a go-kart race or a grand prix, you have to drive as quickly as possible and at Le Mans you can get a rhythm lap by lap. We were able to isolate from this pressure. If I look back, oh my God... it was all in our hands and the conditions were difficult, staying on slicks in the rain. Then in the last stint I got a slow puncture and was told I needed to keep going. The weird thing was I thought I was second and Leena was giving me the gaps – and it was increasing, yet I was pushing more and more! How is this possible? How is the Peugeot

getting so much of a lead? I was taking crazy risks. Then I pitted for a full service and came out in front. I thought, this is weird... Then I knew we had it in our pocket. We put on four fresh tyres, the Peugeot was six seconds behind and we finished 13 ahead. For us, it changed the dynamic. It gave us confidence, we were

fully established in the team, we gained momentum and respect. We were on a roll from then on, and the team was behind us.

“Winning Le Mans is one of those races that changes your life. You feel like you have achieved something and can give back something to all those who have supported your career. It’s

a serious achievement that gives you power.”

**“I enjoyed being an F1 driver for the weekend. It was two laps”**

**M** *What was the dynamic like with Tom, Allan and Dindo? They were the legends but you shook things up.*

**AL:** “It was good. To be honest, we owe them because they embraced us, even though I’m sure in some moments there was still competition. They understood it was also important to show us the way. I remember once in a press conference I said something that could be taken as offensive. After, Tom came to me and said, ‘Why do you say this thing? Do you want to be a champion? Do you want to be great? You don’t say this.’ I appreciated it, that he took this fatherly responsibility, even if he was not happy with me. There was a good atmosphere. Maybe sometimes there was friction, like in any team. But overall they welcomed us and we had a good time together. I’m thankful to have been on their side and it was a valuable time in my driving career.”

**M** *A fantastic time for you, racing fantastic cars. And then Porsche came in. What impact did that have on Audi?*

**AL:** “A big one, because the team had to react quickly, especially on the powertrain side. Porsche was very advanced being in the top megajoule class, which gave them more performance. Audi restructured because it missed the train a bit on the hybrid side. We were stuck with the flywheel and we didn’t have the battery technology, so it invested a lot in aerodynamics. The car was great to drive because of a good chassis and good aero, but we would lose out on the Porsche big time in a straight line. We were playing cat and mouse. Remember 2015? Marcel was having this great fight with a Porsche, he would pass in the corners, but then pow! They would fly past on the straight. It was quite often that dynamic. Porsche also brought a huge professionalism

Lotterer’s final Audi drive at Le Mans was 2016, finishing fourth with his faithful band of team-mates Fässler and Tréluyer







**A taste of Formula 1 at Spa in 2014, but Lotterer's Caterham was soon out of action**

in terms of operations and pitstops. It came in on its A-game. It pushed Audi to restructure and that doesn't happen from one day to the other. Finally in 2016 we had the last, more powerful R18, which was still not eight megajoules - it was six. On paper it was a good car, but we had problems because Audi was on the limit with everything and the car was not reliable enough. Then Audi pulled out."

**M** *You are privileged to have experienced both. How did the transfer happen and how did it compare?*

**AL:** "When Audi stopped there were two options: Toyota and Porsche. For me, my dream was to race for Porsche. I grew up with my dad's race team and there were Porsches all the time. Some kids are for Ferrari and some are for Porsche - I was for Porsche! In combination with Le Mans it was just legendary and when I had the chance to join Porsche I didn't think twice. I remember my first test, the car was so different to the Audi, I had to relearn how to drive. The concept was still LMP1, you think it should be similar. It was so different. It was much more of a straight-line car because it had more energy recovery that would stabilise the car with the front differential, and the smaller V4 engine had less torque, so on engine braking it was also not so stable. Basically you had to brake late to gain time in a straight-line and cornering was a bit more difficult than in the Audi. I had to drive the corners more in a V-shape, focusing more on the exit. It took a bit of time, and it was also not easy on the low-downforce package [for Le Mans] because we were more exposed to these things. On the higher-downforce package it was a great car to drive in the corners as well. In all, an enriching experience, to explore different driving styles."

**M** *We must ask you about the one grand prix you did, for Caterham at Spa in 2014. How did that come about?*

**AL:** "I had a good relationship with Colin Kolles

who was running the team, going back to 2009 and my first Le Mans which came together at the last minute. I will always be thankful for that opportunity because it changed my career. So we kept a relationship and he called me up when he wanted to swap drivers [André replaced Kamui Kobayashi]. I know Spa well and he wanted to give me the opportunity. At that stage of my career it was a gift to participate in an F1 grand prix. I didn't think it would be a big deal, but it was a big thing in the news. The Caterham hospitality was full, there were thousands of questions - wow! I enjoyed being an F1 driver for the weekend. I didn't test the car, just did a bit of sim work in between my seat fit, so I went to just have some fun and to see what happens. Qualifying went well [André qualified 21st, ahead of team-mate Marcus Ericsson], but unfortunately in the race a fuse popped when I went over a kerb and the car shut down. It was only - almost - two laps. But it was a cool experience regardless."

**M** *You are part of an elite group that also includes Kristensen who should have had an F1 career, but didn't. Does it bother you?*

**AL:** "No, not at all. I'm very happy with the career I have managed to achieve up to now."

**M** *Speaking of now, where are you at? Formula E has been tough on you, hasn't it?*

"Yeah, there's been a lot of 'could've, should've's! But I've had good moments. It's tough on a lot of people, it's an unpredictable championship and it keeps the challenge alive. It's nice to have something like that at this stage because it keeps the motivation."

**M** *So what's left for you?*

**AL:** "First to focus on Formula E and try to win a race. Porsche is still new in this championship so I'm committed to the project to bring the team up. Then long-term... it's hard to plan in motor sport. I've done a lot, but this is what I love to do, I love to race. As long as the challenge is there I'm up for it. Winning is something that always drives me. I'm focused on Formula E, but being a Porsche works driver I'm in good hands and there are things in the future that are coming that can be interesting, too. In 2017 we were about to win together at Le Mans, but unfortunately we had to retire [the No1 919 Hybrid had a lead of 13 laps with three hours to go when it stopped with lack of oil pressure], so that is something I'd love to achieve - to win Le Mans in a Porsche."

**M** *Everyone is excited about LMDh and what is coming in 2023. You'll be in your early 40s. Do you feel it will still be realistic for you?*

**AL:** "Of course. I feel as fit and motivated as ever, so I don't think that's an issue. Fernando Alonso is doing well in F1 at 40. Tom, Allan and Dindo were very competitive into their mid-40s, so that is definitely something that can work from my side."

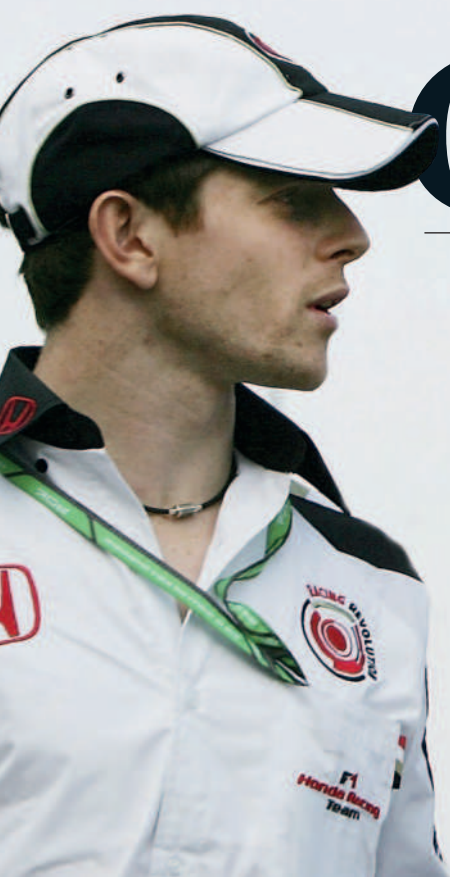
**M** *We're all excited about what is to come...*

**AL:** "Yes, it's great for Le Mans. For now it's a shame not to have more manufacturers, so the FIA and ACO have done a good job to put things together. I don't know how many brands there are going to be - but it looks like a lot at the moment [Porsche, Audi, Ferrari, Toyota, Peugeot, Cadillac, plus perhaps BMW and Honda's Acura brand]. Yes, it is exciting." **Q**



**M. Fässl was a second win in succession at Le Mans 2012 with an Audi 1-2-3**





# MY Greatest RIVAL

**ANTHONY DAVIDSON  
ON JENSON BUTTON**

Toe to toe from their karting days, this Brit pair would eventually line up on the same grids in F1 – and, for a single race in 2005, as team-mates



**I** FIRST CAME ACROSS JENSON WHEN I was a novice racing karts in Wigan in 1988 on a motorcycle track called Three Sisters. There was this other kid on the grid, it was chucking it down with rain, it was his last race as a novice and he was faster than me. I was impressed, the way he drove, his posture, his style, and I realised he was going to be a challenge. We became great rivals, representing Britain in Europe, both winning championships, always at the front, and Dan Wheldon was right up there at the front too.

I thought I was going to get stuck in karting but we both went up to Formula Ford, him two years before me, and we both won the Formula Ford Festival so there was great respect between us as well as rivalry. He was knocking on the door at Williams when I was still in Formula Ford. He had good backing. My path proved more difficult, but I'd beaten him in karts and knew I could make it in the end.

By 2002 we were both on the same grid again, Jenson in the Williams and I'd got the drive with Minardi before moving to BAR Honda first as test and reserve driver and then in the race seat. Amazingly, in 2005, Jenson and I were team-mates for one race



From top: Button, here age 13 in 1993, learned his trade in karting alongside Davidson; Honda's Rubens Barrichello, Davidson and Button at Interlagos, 2006

at BAR, when Takuma Sato was unwell in Malaysia, and it was really funny after all the history we'd shared since '88. It was bizarre, that race. His engine blew up after two laps, I was sliding around on Jenson's oil, and then – as I passed his stationary car – I started sliding on my own oil and my engine blew up. That was it. He had an exceptionally smooth style, very good in mixed conditions. I remember watching him at Rye House in cadet karting; his dad John Button had sent him out in the rain on slicks and he was just pounding round in the rain, honing his smooth style, and that must have helped him later on.

Much later I was watching him race along with karting ace Terry Fullerton and Terry said to me, "That kid's going to be very good in cars. That smooth style will stand him in good stead." Jenson was my big rival so I wasn't going to admit he might be right. Now, there's no envy at all, none whatsoever. I'm just so happy that Jenson went on to win the F1 World Championship. I won the World Endurance Championship and our old karting mate Dan Wheldon won the IndyCar Series and the Indy 500 twice. We all knew we were good enough and so I'm just chuffed that we all won those championships."

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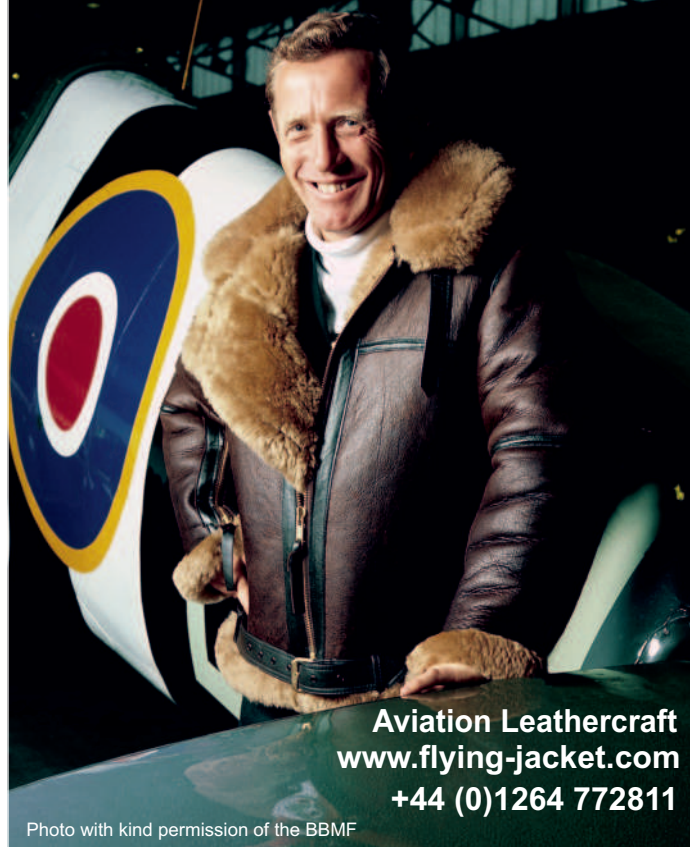
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# Flashback...

For two decades **Maurice Hamilton** reported from the F1 paddock with pen, notebook and Canon Sure Shot camera. This month we are at the 1989 Japanese Grand Prix as Marlboro promo personnel struggle to move an oversized Alain Prost

**T**HE CANCELLATION OF THIS YEAR'S JAPANESE Grand Prix has deprived Formula 1 of more than a magnificent race track. Suzuka also produced a very different kind of passion within bizarre and fascinating surroundings.

A funfair in bright pastel colours, populated by babbling stall holders with high-pitched voices, brought a feel of Disney World to the area behind the main grandstand. A walk through this zone made an interesting start to the day, mainly because you never knew what to expect.

I came across this scene in 1989. Intrigued as to what the two guys would do next, I watched with increasing amusement as they tipped Alain Prost, face down, into a prone position, got underneath and carried him feet first through a road tunnel and into the paddock. Not long after, two more Marlboro promotion men struggled into view with a similar fully inflated effigy of Ayrton Senna. They managed to avoid a collision; that, of course, would be reserved for the real thing later in the day.

Japanese fans took fervour to a new level. Rather than run the gauntlet of spectator areas, drivers preferred to take a helicopter for a short hop from the circuit hotel to the paddock. You can imagine my surprise one year when I met Gerhard Berger, striding through the fair on a Friday morning. With hands buried in the pockets of his jacket, Gerhard explained that he was also captivated by a unique atmosphere that was admiring and yet gently menacing at the same time.

"Don't stop; don't take your hands out of your pockets," he explained. "Do one autograph and you're completely finished. You'll never reach the paddock."

Berger walked briskly. It made quite a sight, the lanky Austrian towering over a rapidly increasing number of followers stumbling and tripping as they tried to run backwards while taking photographs. The fans could not believe what they were seeing. By the time we got close to the sanctuary of the pedestrian tunnel under the pit straight, word had swept through the surrounding area - largely through squeals and screams. Some of the girls were sobbing, not because they weren't getting an autograph but simply through being in the presence of an F1 superstar.

The security guard at the tunnel entrance, having experienced a typical orderly morning thus far, looked alarmed and then mildly terrified as he was descended upon by this racing idol with his unruly disciples. Seconds later we were in the tunnel, Berger chuckling as the cheerful commotion he had created became a distant echo.





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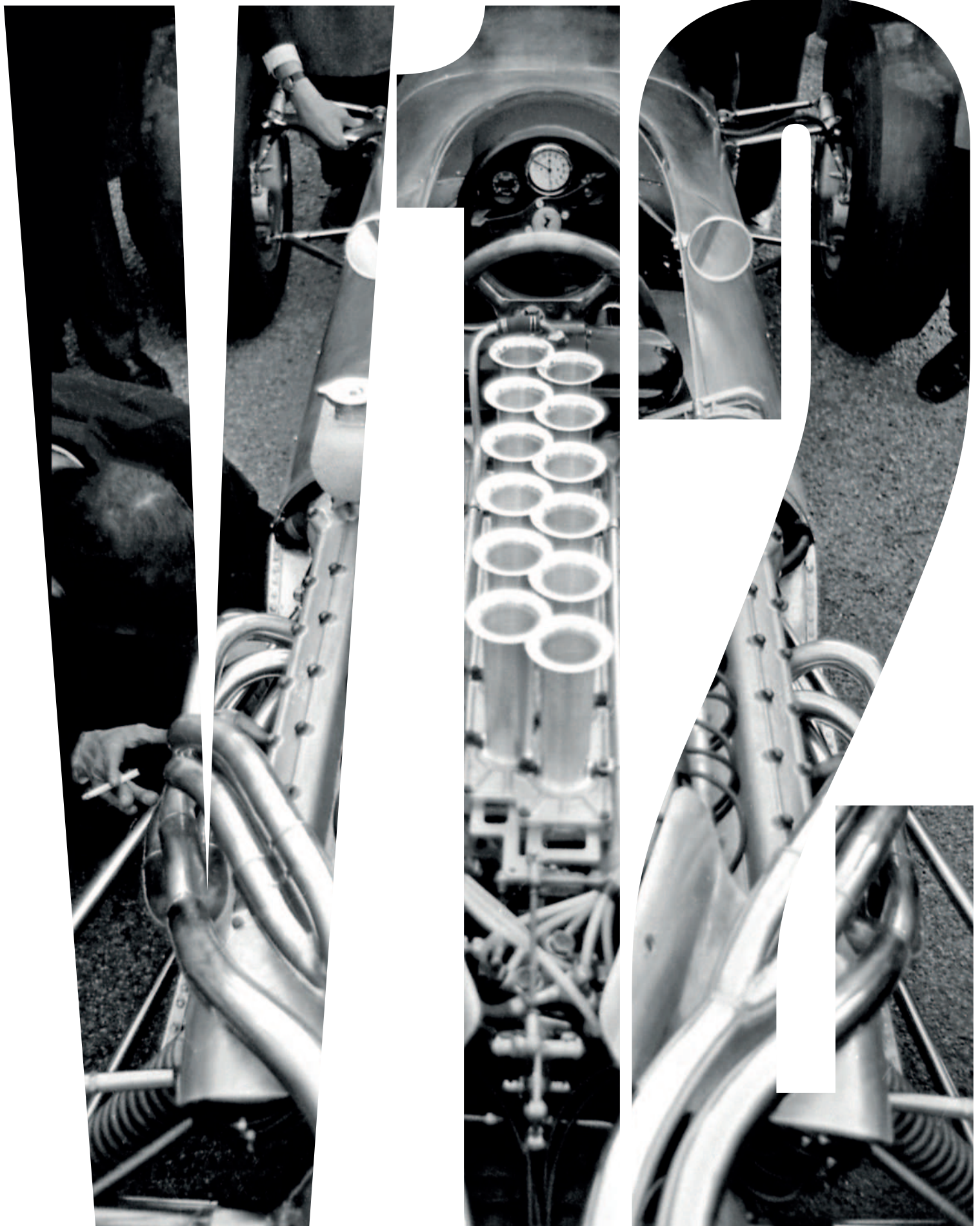
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We seem destined to enter an era of near-silence. Motor racing could soon be characterised purely by the sound of tyres on asphalt, rather than the wail of internal combustion. The rise of electric and alternatively powered motor sport may be environmentally preferable, but it's certainly not manna for the soul. Here is our ode to that most cacophonous of engines, the V12







# The rise to power

With a lineage that takes in boat racing, aero-engines, the Land Speed Record and F1, the V12 has brought joy and tragedy along its journey. **Paul Fearnley** delves into the engine's history to find out why its notes stir the senses like no other





*Triplex*, owned by wealthy American JH White, left, had taken the Land Speed Record in 1928 with Ray Keech driving. When Keech refused another LSR attempt for White, garage owner Lee Bible, right, was drafted in – with disastrous results





Ultimately it was the sound. Higher rpm delivered smoothly thanks to smaller, lighter reciprocating parts and an even firing order, plus the cachet of costly complexity, added to its appeal. But only when trusted engineering lieutenant Luigi Bazzi roared off did Enzo Ferrari break into a smile.

Just prior to holing his driving career by slinking from the 1924 French Grand Prix, Enzo was beguiled by Delage's groundbreaking 2-litre; and though no match for the supercharged straight-eight Alfa Romeo P2 that he was meant to drive, that 'song' never left him.

Now, 23 years later, he had a V12 of his own. That it sat in a rudimentary chassis sans bodywork was of no importance. Only that beating heart mattered. With a chirrup on the cold cobbles of Maranello's courtyard, he accelerated along the three-mile straight to Formigine, as his small team held its breath.

The harshest winter in living memory and an ambitious project running 12 months late had strained relationships. Engineers Giuseppe Busso and Aurelio Lampredi had quarrelled about how best to interpret and implement the absent Gioacchino Colombo's schemes and sketches for this oversquare - a bore and stroke of 55x52.5mm - 1.5-litre. The atmosphere was tense on March 12, 1947.

The car coasted in upon its return. It was nothing without the noise. Bazzi spotted the oil streak that had caused Ferrari to switch off. Offending cam-cover bolt tightened, he took his turn at the 125's wheel. Now it dawned on Ferrari, face still stinging but ears no longer buffeted: it sounded as good if not better from outside the cockpit.

He wrote in his 1963 memoirs *My Terrible Joys*: "It was forecast that I was bringing about my downfall, the experiment being just too daring and presumptuous." In fact, daring assured this conservative man's future. For Colombo's neat 'short block' - separately machined, press-fit cast-iron wet liners packed tightly but with sufficient meat for future expansion, and shallow hairpin valve springs - not only brought immediate racing success but also would underpin the world's most glamorous car brand for the next four decades.

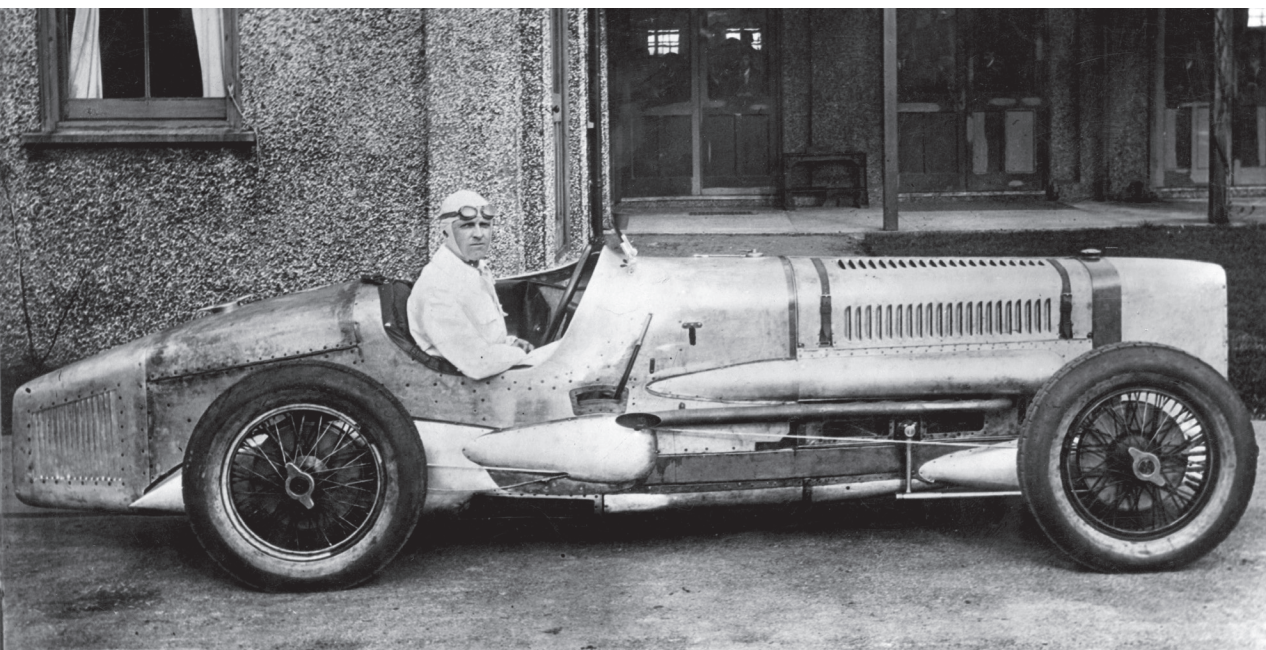
A V12, however, was nothing new. The first - a 90-degree for marine usage - emerged from Putney Motor Works in 1904. Early ●

**Above: Robert Benoist in a Delage 2-litre V12 races through Dunlop Bridge at Lyon in the 1924 French GP. No9 came in third, almost 11½mins behind winner Giuseppe Campari in an Alfa**

GETTY IMAGES; ALAMY



## V12 ORIGINS



Clockwise, from left, Henry Segrave with the V12 Sunbeam which reached 152.33mph at Ainsdale Beach, Southport in 1926; Maranello, from left, Giovanni Bracco, Enzo Ferrari, Gioacchino Colombo and Luigi Villorresi; the 1923 Delage DH V12 photographed at Goodwood Revival; Sunbeam driver Kaye Don, left, and the French-born engineer Louis Coatalen, far right, at Daytona Beach in 1930; in the early 1920s Packard in the US started development of new V12 aero-engines, which were inverted so the propeller had maximum ground clearance





iterations, however, were restricted by prevailing bearings and ignition systems to large, (relatively) low-revving applications in aeroplanes, motorboats and luxury cars.

It was Sunbeam of Wolverhampton's Brittany-born chief engineer Louis Coatalen who fitted a 200bhp side-valve 9048cc to a single-seat racer nicknamed *Toodles V* after his wife. Banks of two iron blocks-of-three were at the preferable 60 degrees, the left slightly forward to allow for side-by-side big ends on the same crank pin. Along with the camshaft within the vee, they were atop an aluminium crankcase with novel dry sump. The car shone at Brooklands: most miles in an hour being among eight world records in

elements of its smaller Arab V8 cousin - aluminium blocks with integral heads containing three valves (one inlet, two exhausts) per cylinder, operated by a SOHC per bank - Sunbeam stressed that this was not an aero-engine. A twin-spark 18.3-litre featuring articulated conrods to shorten crankshaft length, the latter held by seven white-metal bearings, it produced 357hp at 2500rpm. Purchased, modified and rebranded *Blue Bird* by Malcolm Campbell, it broke 150mph on Pendine Sands in July 1925.

Coatalen had designer Capt JS Irving place a four-cam four-valve twin-spark 22.4-litre Matabele into the nose and tail of Sunbeam's challenger of 1927. Though their combined

in August 1935. And Sunbeam's 18cwt 300bhp 4-litre, which Segrave steered to 152.33mph on Southport's beach in March 1926, also led that year's Libre road races at San Sebastián and Monza before retiring.

**D**ELAGE'S 2LCV, HOWEVER, WAS a genuine no-compromise GP car. Gear-driven twin-overhead camshafts per staggered iron bank operated two valves - at an included angle of 100 degrees - per cylinder in fixed heads with hemispherical combustion chambers. A one-piece crankshaft was held by split-cage roller bearings, seven of them, as were the big ends. And those 23 timing gears ran in ball races. Lilliputian pistons with a stroke of 80mm equated to 1992cc.

The car was rushed through for the 1923 French GP at Tours and led briefly from a pole decided by ballot before retiring early. Louis Delage promptly sacked designer Charles Planchon - his cousin! - and placed underling Albert Lory in charge. Supercharging was considered for 1924, but an updated 120bhp version ran unblown and unspectacularly at Lyon to finish 2-3-6 behind Italian Giuseppe Campari's Alfa P2.

When Roots-type superchargers were adopted, one per bank, for 1925, the effect was profound due to a large piston area: a 70bhp increase at 7000rpm. After a disastrous European GP at Spa - Lory had neglected to incorporate pressure-relief valves in the inlet manifolds - Delages finished 1-2 at Monthléry and 1-2-3 at San Sebastián. Alfa's was still the quicker car, however: Antonio Ascari's P2 was leading in France when he crashed fatally and the team withdrew; and the Milanese skipped the Spanish event.

## "Segrave was pushed beyond 200mph on Daytona Beach"

1913. In truth, it was a test bed for an aero-engine - development was easier and safer on the ground - made urgent by impending global hostilities. Actual combat would further force technology and production.

America's Liberty L-12, designed in five days by Packard's Col Jesse Vincent and Elbert Hall of Hall-Scott, generated a robust albeit lumpy 400bhp from 27 litres, and was built in huge numbers: almost 14,000 by the Armistice. Its power and availability, plus that of Sunbeam's Manitou and Matabele designs, fuelled the Land Speed Record in the '20s.

Coatalen's latest 'aeroplane on wheels' achieved 133.75mph when driven by Kenelm Lee Guinness at Brooklands in May 1922. However, though based on Manitou, with

output was less than the boastful 1000hp painted on the red car's flanks, it pushed Henry Segrave beyond 200mph on Florida's Daytona Beach in March.

The White Triplex that ran 207.55mph in April 1928 featured three war-surplus Liberties: one out front and a side-by-side pair out back: 1500bhp from 81 litres! Driver Ray Keech wisely refused a second attempt and the aptly named Lee Bible, a garage owner with no prior experience, stepped up. He and a Pathé cameraman, Charles Traub, were killed in the ensuing accident.

But the LSR wasn't all thunder and blood. Delage's DH of 1923, though hardly small at 10.5 litres, was sufficiently manageable for 4ft 10in Kay Petre to lap Brooklands at 134.75mph







Above, from top: the portly Mercedes-Benz race manager Alfred Neubauer with the 3-litre V12 W154 at the 1938 French GP; the Schneider-winning Supermarine S.6 of 1929 was powered by Rolls-Royce's V12 R engine; the V12 of the Delage 2LCV was an inspiration for Enzo Ferrari. Below, Sunbeam's 1000hp Mystery was powered by a brace of 22.4-litre Matabele aero-engines and in 1927 at Daytona Beach became the first car to smash 200mph

GETTY IMAGES

V12's GP zenith remained some way off. It was, however, still the thing for the LSR.

The supercharged 36.7-litre Rolls-Royce R won the biennial Schneider Trophy for seaplanes twice consecutively from 1929 before topping 400mph in Supermarine's S.6B. Its 2800hp then pushed Campbell's latest *Blue Bird* beyond 300mph on Bonneville's salt flats - more space for more power - in September 1935. George Eyston's *Thunderbolt* used two to reach 357.5mph three years later.

Pure speed in Europe had a different look, smaller, more efficient cars gunning along Hitler's autobahns at 250mph. Mercedes-Benz had hoped to use its 600bhp 5.6-litre DAB in GPs in 1936, but it came in much too heavy. The compensatory lopping of 25cm from its intended chassis resulted in a cramped mongrel reliant in any case on an overstretched straight-eight. DAB would be the preserve of record-breaking thereafter, although Manfred von Brauchitsch drove one, now delivering 736bhp, to a heat victory at the 1937 Avusrennen. His streamliner retired on the Final's opening lap. These were rare problems for a team otherwise incredibly advanced and meticulously organised.

**S**PURRED BY AN AUTO UNION lacking the resources to beat Mercedes-Benz at its own game and therefore adopting a radical and cheaper but prescient approach, these Silver Arrows raised technology and build quality to levels unmatched in GP racing until the late 1980s. And both outfits plumped for a 3-litre V12 for their W154 and D-type models for the formula introduced in 1938: a sliding scale of minimum weights (from 400-850kg) for engine sizes

from 666-3000cc supercharged/1000-4500cc normally aspirated.

Each were high-compression, high-revving - undersquare yet upwards of 7500rpm - high-boost units benefiting from Roots-type superchargers, a pair for the Mercedes, a singleton for the Auto Union. The former had forged steel cylinders within welded water jackets, whereas the latter's blocks (with steel wet liners) and detachable heads were aluminium. Mercedes opted for four valves per cylinder operated by twin overhead camshafts per bank, whereas AU went two and three, a central camshaft acting on the inlets while the outers, driven by short cross-shafts and bevel gears, managed the exhausts. Mercedes' one-piece crankshaft ran in seven roller bearings, whereas AU's fabricated Hirth-type ran in plain, although the big and little ends of its one-piece conrods featured rollers.

Both had a prodigious thirst, especially when two-stage supercharging - a larger primary feeding an in-series secondary - boosted output toward 480bhp by mid-1939. The Mercedes carried almost 90 gallons of carefully blended fuels, which it guzzled at 2-3mpg: the price of victory. Though its V12 was shorter than its previous V16, Auto Union fitted a smaller central fuel tank so that the driver could be moved further back between saddle tanks: the next GP generation was taking shape. Gradually.

Delahaye's 145 was a truck in comparison, its pushrod OHV 4.5-litre by Jean François featuring blocks from magnesium alloy and two spark plugs per cylinder but generating just 250bhp, albeit frugally and with gobs of torque. A two-seater built for Lucy O'Reilly Schell's Ecurie Bleue to win the Million Franc race - a government-backed time trial at Montlhéry in August 1937 intended to give





(eventually false) hope to French manufacturers. Entered for the Pau GP of April 1938, René Dreyfus beat the unsorted Mercedes-Benz to pole and won, running non-stop in a car with a power perfectly suited to a tight street circuit slicked by oil. The monoplace 155, however, was a bust.

Alfa Romeo, via Scuderia Ferrari, tried harder to keep up with the Germans and achieved a little more success. Initially. If a track was slow. And usually if Tazio Nuvolari was driving. Designer Vittorio Jano's challenger of 1936 had received a supercharged 370bhp 4.1-litre V12. But it wasn't enough. His lower-slung effort of 1937 was stretched to 4.5, had two smaller superchargers instead of one, and roller bearings instead of plain. It cost him his job.

**A**LFA STEPPED IN FOR 1938 AND created an eponymous Corse (employee Enzo hated it). Jano's replacement, Spaniard Wifredo Ricart (Enzo hated him, too!), with Colombo's assistance, threw everything at the new formula - straight-eight, downsized V12, twin-crank V16 - to marginal effect. Their next project, however, was a what-might-have-been: a red 'Auto Union'.

Auto Union was reportedly developing a 327bhp V12 for the 1.5-litre GP formula purported for 1941. Colombo's response was a fractionally undersquare flat-12 with two camshafts per bank, two valves per cylinder and two-stage supercharging at 32psi. It weighed less than the 225bhp blown straight-eight of his 158 Alfetta of 1938 and developed 335bhp at 8600rpm. Ricart placed it behind the driver. Alfa threatened to wheel out Tipo 512 after the war, but its Alfetta, improved by Colombo and eventually boasting 400bhp, continued winning so there was no need.

Underachieving over-ambition is a coda of this part of V12's story.

At Porsche, Karl Rabe's F1 design for Cisitalia's Piero Dusio was a 4WD with an oversquare 1.5-litre flat-12 with three superchargers (two in the flesh) sited behind a driver operating a sequential motorcycle-style five-speed gearbox with synchromesh to keep it singing: beyond 10,000rpm was projected. Dusio ordered six. When inevitably bankruptcy beckoned, he struck a deal in 1949 with dictator Juan Perón to found Autoar [sic] in Argentina. The only completed F1 car was shipped over but never raced.

Alfa's mooted Tipo 160 for the new F1 of 1954 was said to be a 2.5-litre flat-12, probably a 4WD, with its driver hung beyond the rear axle. A modified Alfetta assessed that odd



Above, the Swiss Grand Prix in August 1938, with the 3-litre V12s of Auto Union and Alfa Romeo. Left, Ferrari's 4.5-litre V12 of the 1953 375 MM Scaglietti-bodied Spyder. Below: Swiss driver Gérard Spinedi flings his Ferrari 250 GT SWB into the Gasworks Hairpin at Monaco during the 1963 Tour de France. Right, Tazio Nuvolari in the Gioacchino Colombo-designed Ferrari 125S, with its 60-degree 1.5 V12





seating position - the slipstream whipped off the goggles of an otherwise satisfied Consalvo Sanesi! - but the project went no further.

These are just two of the many: a competition V12 of this period was no sinecure.

The war in the Pacific was raging still when Colombo drove from Milan to Maranello using black-market fuel, and a barge to cross the Po, the bridge at Piacenza having been destroyed. Maranello had been bombed, too - twice - but this smaller, nimbler company, yet lacking the foundry that would make it a reactive powerhouse, was recovering more quickly than an Alfa Romeo reduced to making kitchen utensils. Colombo, in turn, was moonlighting while communists assessed his fascist 'sympathies' - a twitchy business given that his former boss Ugo Gobbato had been assassinated - and began work in a bedroom/studio on a borrowed drawing board. Before the year was out, Alfa would recall him to revive and refresh 158. Ferrari's project stalled.

Colombo recommended Busso, who was joined in Maranello's sparsely populated, inexperienced drawing office by Lampredi, four years the younger but with a more forthright manner. The engine intended as a racing unit first and a series-production item second 'burst' into life on September 26, 1946: 60bhp at 5600rpm! Thinwall shell bearings couldn't come soon enough.

Power had almost doubled by the time Franco Cortese gave it its competition debut at Piacenza on May 11, 1947; he retired lately from the lead because of a faulty fuel pump. A fortnight later he won at Rome - and then was victorious at Vercelli, Vigevano and Varese. Minor stuff, but wins nevertheless. Nuvolari's successes at Forlì and Parma gained much more favourable press for Ferrari. And Raymond Sommer's in Turin in October was its first international win.

Colombo, embroiled in more controversy at Alfa, was contributing again. His criticisms caused Busso to leave (Lampredi had already joined Isotta-Fraschini). Colombo played hardball with Enzo: he would work part-time and commute from Milan. He was of the 'Jano school': a hands-on innovator with little time for theory. In contrast, Lampredi, returned on a full-time basis and more methodical and considered, was reluctant to veer from a finalised drawn design. Divergent paths.

Giuseppe Farina scored Ferrari's maiden F1 victory at Garda on October 24, 1948, but its stubby single-seater was no match for the Alfetta at the more prestigious races. The latter would take a sabbatical in 1949, as would the works Maseratis - BRM, meanwhile, was busy proving that 16 was four pots too many - and so Ferrari would make hay, winning the Swiss



## "That V12 note, in the darkness if necessary, was a siren's song"

and Italian GPs, plus the Mille Miglia and 24 Hours of Le Mans and Spa.

Its sports cars and F2s continued to rack up victories in 1950, but its F1 car, even in 315bhp twin-cam two-stage-supercharged form (by Lampredi), was easy meat for the Alfetta upon its return for the inaugural World Championship. Lampredi's dissenting voice was heeded. Having twice been beaten in 1949 by a Talbot-Lago making fewer pitstops, and correctly positing that Alfa's straight-eight was at the end of its development tether, he proposed a normally aspirated 4.5-litre V12 (Colombo had rejoined Alfa Romeo).

Increasing from 3.3 via 4.1 to 4.5 in 1950, while maintaining oversquare dimensions, chain-driven SOHC and two valves per cylinder, its head and blocks were cast as one, its cylinders threaded. This more complicated method was labour-intensive and indicative of Enzo's desire and his company's confidence. He loved Alfa but railed at how it had treated him. He got his revenge with Ferrari's victory at Silverstone 1951: "I have killed my mother."

Lampredi's 375, now a twin-spark, had the upper hand and Alberto Ascari won in Germany and Italy; likely he would have become champion but for a poor tyre choice at the Barcelona finale. He would, however, dominate the next two championships, reduced to F2, using a 2-litre 'four'; paying for the design and build of full-shot GP motor of any configuration appeared prohibitive. Those

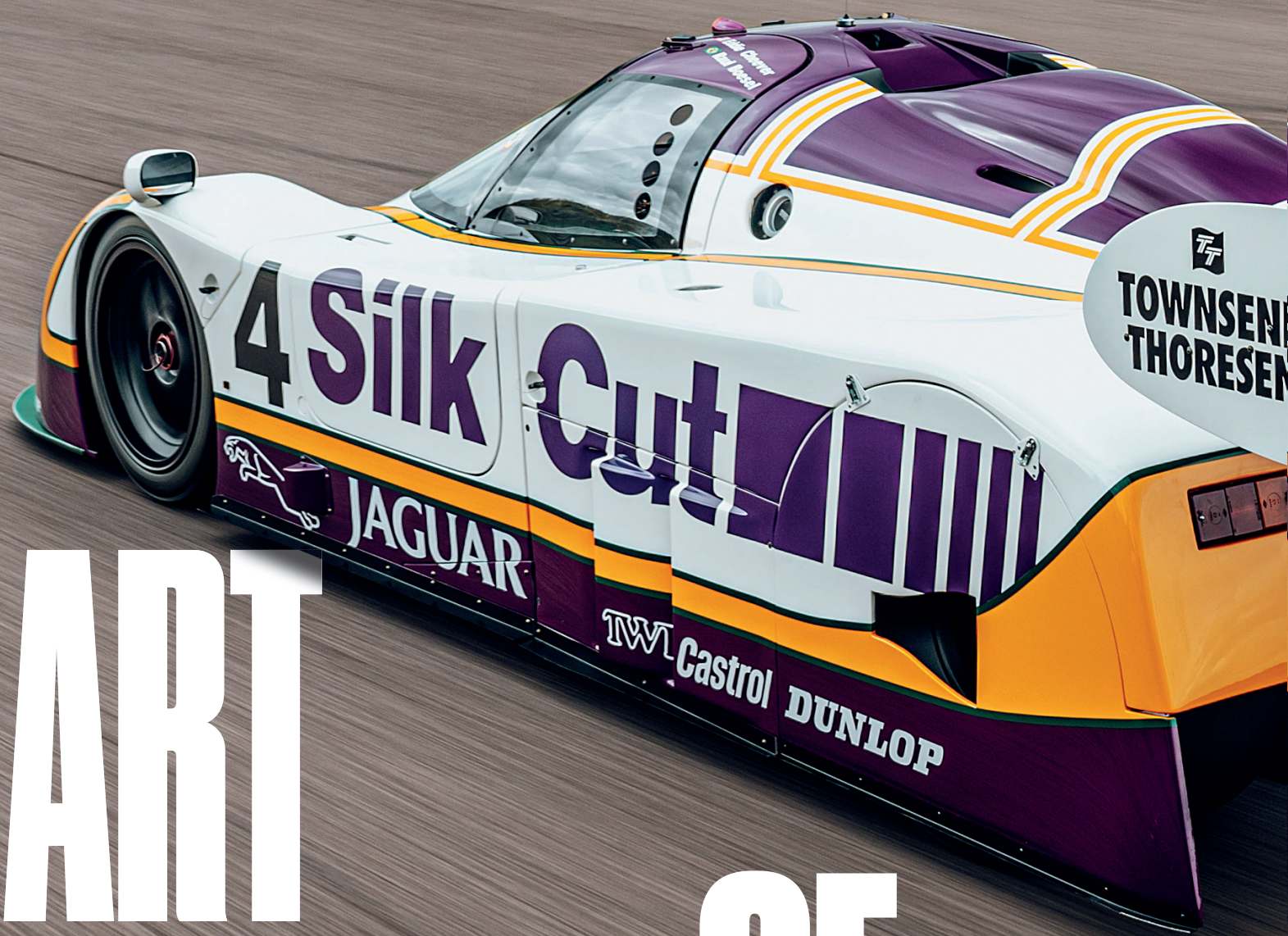
successive wins in 1951 were the only three by a V12 among the 29 World Championship GP victories achieved by Ferrari that decade. Engines of eight cylinders or fewer, the vast majority in-line, won the other 81 rounds.

**S**PORTS CAR RACING - PACKAGING LESS restrictive and important, reduced vibration a boon for extended reliability - was different. Ferrari won 19 of 42 rounds of a World Championship created in 1953. All but two were scored by a V12. Lampredi's 'long block' was a potent force in the middle of the decade, and Jano's interim - Lampredi departed after a disappointing 1955 - continued the theme with a mix of Lampredi architecture and Colombo internal dimensions, along with the adoption of twin-overhead cams per bank.

A reduction to 3 litres from 1958, however, had sparked the resurgence of Colombo's original. Having already begun its association with the 250 GT dynasty, a modified 1953-style block was used by new tech chief Carlo Chiti to power a second-generation Testa Rossa to Ferrari's fifth world title in six years.

These endurance races were what piqued vital American interest in burgeoning Ferrari. That tingling V12 note, howling in the darkness if necessary, was a siren's song. It took time for Enzo to appreciate the former fact. He understood the latter sensation the moment he heard and felt it: a sound investment. **o**



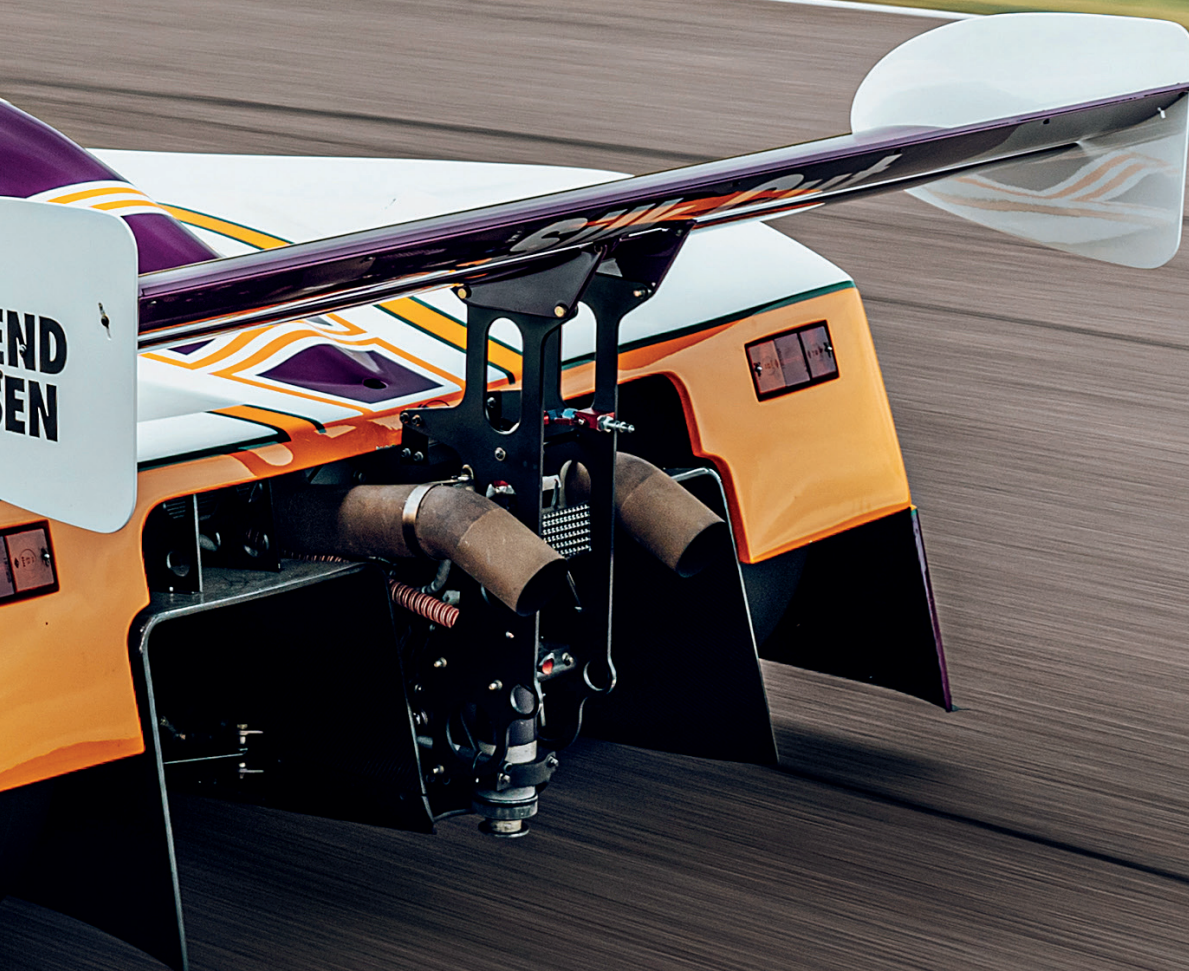


# ART OF



## JAGUAR XJR-8 TRACK TEST

Coventry-born engineer and designer Tony Southgate masterminded the XJR-8, which was based around a lightweight carbon-composite moulded chassis tub



Having previously put a Porsche 962C through its paces, **Andrew Frankel** finally gets to drive the sports racer that gave the Germans a mauling in 1987 – the Jaguar XJR-8. And this chassis was the wildest of all

PHOTOGRAPHY: JAYSON FONG

# NOISE





For the 1987 WSC season, Jaguar used 14 drivers; Brazilian Raul Boesel, eventual world champion, would drive No4 in each round. Below, from left: Mr Frankel straps himself in; V12 intestines; functional 1980s cockpit; covered rear wheels helped improve downforce by as much as 10%





**W**E'RE OUT THE BACK now, the chicanes behind us. The oil is warm, the slicks are hot. I can feel the V12 chuntering behind me. It is demanding its release. Third gear, 4000rpm and go. The thrust is almost overwhelming - 750bhp in less than 900kg of car tends to do that for you. No time to listen. Fourth and the madness resumes. Can a single engine really be doing all this? Despite being protected behind plugs, balaclava and helmet, my inner ears start to itch. Fifth, and the whole crazy show begins again, an insane shrieking symphony blasted out by a 12-cylinder orchestra. And the craziest thing of all? Today I am its conductor.

Famously Jaguar won Le Mans five times in the 1950s. But how many times in that period did it also claim the World Sportscar Championship after its inauguration in 1953? Trick question: the answer is none. Indeed it would not be until 30 years after the retirement of the 1950s works Jaguar racing team that Jaguar would have a proper crack not just at Le Mans, but the championship itself.

The year was 1987 and the car the Jaguar XJR-8. And for the first time since Porsche

entered Group C racing in its 1982 inaugural year, the Stuttgart machines were beaten. Actually, they were routed. There were 10 championship rounds that season and Jaguars won eight. Of those eight races, four were won by a single car, chassis XJR-8 287. This car. So not only did it do the lion's share of the work in delivering to Jaguar its first ever world championship in motor racing, it made the Brazilian Raul Boesel the first man to win a drivers' championship in a Jaguar, for he was at the wheel every time it won, usually sharing with Eddie Cheever, but once with John Nielsen.

It is therefore an incredibly important car. Certainly it was more successful than the XJR-9 chassis 488 which only won a single round of the championship but is far better remembered because it happened to take place at Le Mans the following year...

Its first win at Jerez was an exercise in the survival of the fittest with only eight of 20 starters seeing the flag. It appeared to be an easy win with a three-lap margin of victory, but it came after two unscheduled pitstops and with the pole-sitting works Porsche 962C of Derek Bell and Hans Stuck having to manage an unhealthy powertrain. We'll gloss over Monza where a certain ◀

**"There were 10 championship rounds in 1987 and Jaguars won eight"**







“The car is no museum piece but ready to race, and I am told to treat it as such”

Jaguar 1-2 was lost when Boesel stayed on slicks too long after it had started to rain and parked the car in the gravel.

The second victory came instead on home turf at Silverstone when the only real question was which Jaguar would win. Both had problems - Boesel a puncture, Jan Lammers in 187 stalling at his pitstop - but after a late safety car Cheever outsprinted Lammers, setting a new lap record and taking the flag.

Being originally intended as a sprint car, 287 sat out Le Mans so played no part in the disaster it would be for Jaguar (one out of three finished, down in fifth place), so

reappeared at the Norisring where results would be awarded on aggregate after two heats. Cheever had no luck in the first, losing seven laps in the pits, but Boesel won the second placing them fourth overall.

But at Brands Hatch 287 won again, Boesel snatching victory despite spinning and damaging the car trying to pass Mauro Baldi's 962C, putting him into the championship lead for the first time that season.

The team title was delivered at the Nürburgring which 287 dominated, putting three laps on the field, leading a train of no fewer than seven thirsty 962s, most struggling to mete out their fuel allocation.

Fuel injection problems relegated the car to fourth at Spa, a race worth noting here only because of a typical piece of TWR smart thinking that won Boesel the title. The rules stated that to score points a driver had to be behind the wheel for 30% of the race, but which of the three Jaguars entered had the best chance of victory? No one knew. So Tom's answer was to enter the Brazilian as a driver for all three of the XJR-8s and keep him in reserve until the likely winner emerged. It turned out to be chassis 387 of Martin Brundle and Johnny Dumfries into which he was duly parachuted for a single, title-winning stint.



**JAGUAR XJR-8****Engine:** 7-litre 60-degree V12**Power:** 720bhp at 7000rpm**Weight:** 900kg**Top speed:** 220mph  
(Mulsanne Straight)

The final race was at Fuji, where the two Jaguars were utterly dominant, Boesel and Dumfries dutifully following Lammers and Watson home to allow the latter pair to overtake Derek Bell and Hans Stuck to share second place in the driver's championship.


But chassis 287 was not yet done. Upgraded to XJR-9 specification it spent some of 1988 as the T-car, but was wheeled out as part of TWR's five-car assault on Le Mans where it was driven by Boesel, Watson and Henri Pescarolo but retired early with transmission failure.

It was back at Le Mans in 1989, finishing eighth with the Ferté brothers and Eliseo

Salazar driving and finally in Mexico where Alain Ferté and Andy Wallace brought it home in fifth place. It seems fitting that this car which had delivered Jaguar's first World Sportscar Championship would also be the best-placed Jaguar at the last round in which a V12 Jaguar would take part.

Although it raced as an XJR-8, XJR-9 and XJR-9LM, 287 presents today in original and, to these eyes, most gorgeous XJR-8 specification with those huge venturi tunnels at the back making no secret of the key to this car's speed. It is a downforce monster, helped considerably by the narrow 60-degree angle of its V12, especially

compared to Porsche's rival 180-degree flat-six motor.

Today we are Thruxton, Britain's fastest race track - rather fitting for such a machine. It has been brought by Moto Historics, which looks after it and makes sure it is in the finest fettle. Today it most certainly is: its 7-litre V12 motor is producing the full 750bhp, as much as any Jaguar V12 that raced. This is also getting on for three times the power the engine produced on 5.3 litres when first installed in the E-type in 1971. It is a daunting machine to tackle, especially at a place like this. The car is no museum piece but ready to race and I am told to treat it as such. 





### “You can see people grinning as they bury their digits in their ears”

The cockpit is cramped but what you really notice is how old it looks. There cannot be another area in which the advance of modern technology is more obviously apparent than the interior of top-level race cars. Very little progress seemed to have been made in here since the late 1960s. There's a bare Momo wheel, minimal essential instrumentation ahead, three more minor dials to your left sitting below a bank of simple switches. To the right of the wheel are four further switches for ignition, injection, fuel pumps and start.

It bangs into life easily and idles angrily. Beyond that domed cockpit you can see people grinning as they bury digits in their ears. The March gearbox was always the weak point on these cars and it's not even that quick a shift. I've often wondered how many races Group C Porsches won and finished because the factory had the good sense to fit them with synchromesh boxes. The clutch is gentle enough not to make an idiot of you and soon you're trundling down the pitlane, out into the unknown.

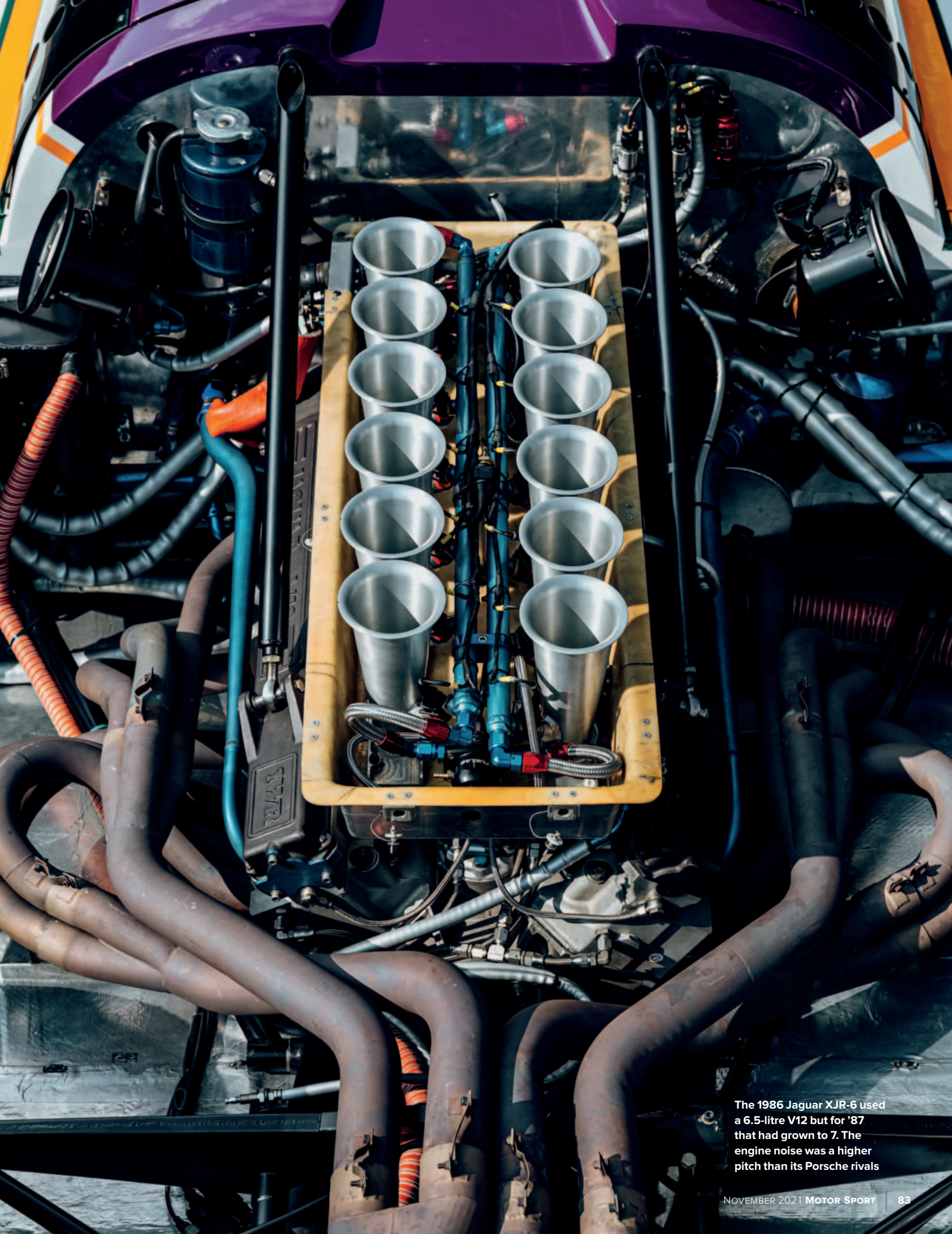
You'd think that with a large, torque-laden V12 motor, the XJR-8 might be easier to drive than a Porsche 962C. But it's not at all, and for several reasons. First you have

to think at all times about the gearbox to avoid wrong-slotting or damaging a cog. Second, that engine may be powerful, but its size and weight mean you can't lean on the car as easily as you might a far shorter and lower flat-six Porsche motor. It is a car you could easily spin under braking into a corner and with only a little more difficulty, under power coming out of a corner.

It feels cumbersome in the chicanes too, inclined to push its nose wide thanks to the tightness of its differential. But once you get it hot and up to a decent speed, it is simply phenomenal. The torque is such that you're always a gear up on where you'd expect to be, yet it still slams you violently into that carbon rear bulkhead every time you floor the throttle. Peak power is at a modest 6500rpm but it's already working hard at 4000rpm, the V12 so loud, complex and melodious I briefly flirted with the fantasy of being a passenger so I could concentrate on its sound without having to drive the car.

But no, I'd hate to be a passenger because I'd have been physically sick within a lap, two at most, because once you're out the back of the circuit and can make its aero work, how fast you go is determined pretty much by how brave you're feeling. Owner 🍷





The 1986 Jaguar XJR-6 used a 6.5-litre V12 but for '87 that had grown to 7. The engine noise was a higher pitch than its Porsche rivals



## JAGUAR XJR-8 TRACK TEST

Henry Pearman later discovered it would take Church flat in fifth and while I was having a proper lift, even with me driving it was still pulling 6000rpm in top approaching the chicane. It clearly has sprint gearing but that still struck me as being plenty fast enough.

I found in just a few quick laps the car to be physically and mentally draining in a way I had never felt a few years ago when I was lucky enough to drive its exact contemporary, the 1987 Le Mans-winning Porsche 962C for far longer at the much more technical Weissach test track.

Truth is the XJR-8 is a beast, one requiring a driver with a level of skill and experience far beyond my own to master, let alone keep in one piece over a gruelling 24-hour period. Perhaps that's why TWR only hired the best and never attempted a lucrative customer programme such as that enjoyed by Porsche.

But as just a thing to get in and drive, the XJR-8 provided not just a mesmerising experience, dominated by the sound and fury of that iconic V12, but one that left me feeling humbled by the thought of those who did so not merely for a few laps but hour after hour, in all weathers, through day and sometimes night.

But that was what was required to do the job and end the reign of the Porsches. And it was the XJR-8 that got the job done, the most successful of which is that you see here. What a privilege to have been able to make its acquaintance. ●

*Our thanks to Henry Pearman, Moto Historics, Gold Track and BARC for their help making this feature possible.*

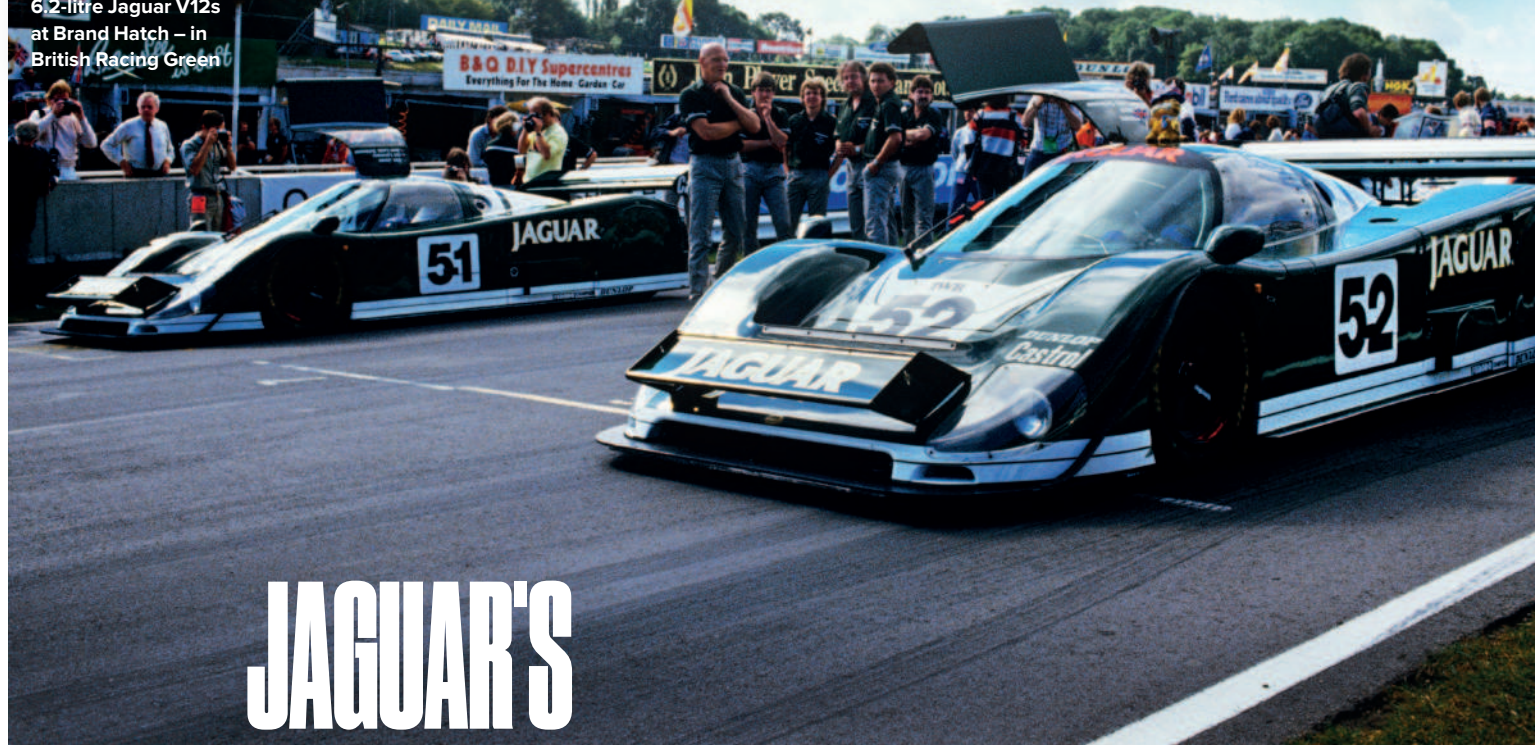
# "I found the car to be physically and mentally draining"



Above: the bare necessities for an invigorating but tough drive; the Porsche 962C is less demanding. Bottom, from left: the twin exhaust that Porsche drivers saw so much of in 1987; note the British Racing Green trim; rear-wheel drive behind those removable panels



Round 8 of the 1985 World Endurance Championship found the 6.2-litre Jaguar V12s at Brand Hatch – in British Racing Green



# JAGUAR'S PORSCHE-KILLER

From 1976-87 a Porsche had taken the flag at Le Mans on 10 occasions but in the early 1980s Tom Walkinshaw Racing had designs on getting Jaguar back among the winners. **Gary Watkins** tells the story of a successful British comeback powered by a V12 that had been compared to a fish and chip shop...







Jaguar XJR-6s, 51 (Warwick/Cheever) and 52 (Schlesser/Brancatelli), pitting at the 1986 Silverstone 1000Kms. Right, job done – Johnny Dumfries at Le Mans '88; co-driver Jan Lammers is behind

WHEN TONY SOUTHGATE saw the engine around which he had to design a new Group C car, he did two things: utter a profanity under his breath and reach for a bandsaw. The swearword was a reaction to the size of the V12 lump in front of him, the bandsaw a tool with which to try to pare it down into a form suitable to go into the back of a pure-bred racing prototype. That car was to be a Jaguar, the first of a line of 12-cylinder machines built by Tom Walkinshaw Racing that would go on to win the Le Mans and Daytona 24-hour classics two times apiece, not to mention a pair of world titles.

That's a pretty decent haul for a car powered by an engine that Southgate describes as "the size of a fish-and-chip shop". He was no stranger to designing V12 racing cars – he'd penned Formula 1 machinery for BRM, Shadow and Osella with engines of such a configuration – but this one was out of a road car and had first seen service in Jaguar's Series 3 E-type back in the early 1970s.

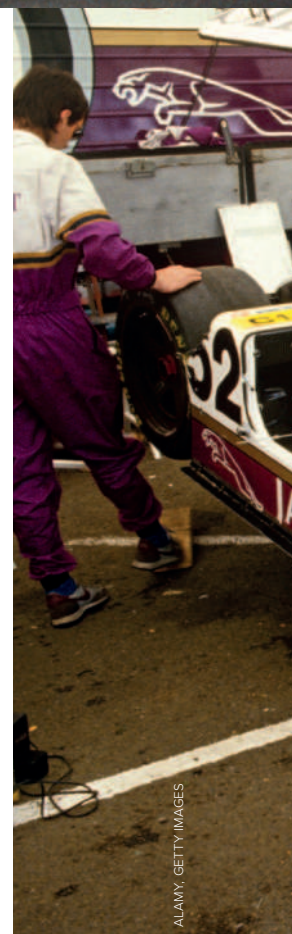
There was, Southgate points out, no debate about the choice of engine when he began work at TWR as a freelancer at the back end of 1984.

"Tom Walkinshaw said I could do anything I wanted, and he obviously liked Formula 1-type technology," explains the British engineer. "But he told me that was the engine we had to use."

Jaguar's return to motor sport in the early 1980s under the aegis of new boss John Egan was about rebuilding a marque that was still part of the state-owned British Leyland conglomerate. Or, in his words, "putting the company back together", as well as "making sure there was a glamour associated with the brand".

"It wasn't about simply racing, it was about racing with Jaguar components," says Egan, who was knighted for his services to industry in 1986. "I wouldn't have gone racing if we'd had to build a special engine. I wanted a very clear connection between Jaguar products and our racing programme."

Jaguar was already making that connection with twin racing programmes that kicked off in 1982 on either side of the Atlantic. Group 44 was representing the



ALAMY, GETTY IMAGES





Frying tonight: this is what a 6-litre V12 looks like, Le Mans, 1986. Above left, XJR-9 at Daytona the same year. Above right, Group 44's 1985 XJR-5

marque in the IMSA GT Championship with a GTP prototype powered by the 24-valve V12, while TWR was fielding the XJS with the same engine in the European Touring Car Championship. These two programmes are intertwined in the tale of Jaguar's ultimate return to the top step of the podium at Le Mans in 1988.

Group 44 boss Bob Tullius had been told by Egan when he was given the go-ahead for the IMSA campaign that he would take the marque back to Le Mans. But he was warned he would eventually lose the programme. Egan had said that "one day we are going to do this ourselves from the factory". Tullius presciently interpreted that comment as more than a hint that the deal would end up going to a British team.

Tullius did take Jaguar back to Le Mans in 1984 with his aluminium-chassis XJR-5. For 1985, there were due to be two teams flying the flag for the marque at the Circuit de la Sarthe: Group 44 and TWR. It was

## "It wasn't about racing, it was about racing with Jaguar components"

planned that the British operation, which had been developing the V12 for the Group C fuel-formula since mid-1983 at Jaguar's behest, would field a pair of Tullius cars alongside the US operation.

That was stipulated in the original Jaguar-TWR deal, but by the time it was signed off in 1985, Southgate was already at work on the new car that became the XJR-6. "You couldn't really imagine Tom running someone else's car, could you?" he says.

TWR did test an XJR-5 in the UK on a number of occasions in the early months of '85, as Southgate progressed the design of its own carbon-chassis car around the V12. In secret and without Jaguar funding.

"I knew the engine was going to dominate the car because of its sheer size and weight," says Southgate of a power source that in full-dressed form in the XJS topped 300kg, aluminium block or no. "We shoved it as far forward as possible with a recess in the fuel tank so it was almost



## RETURN OF THE BRITS

right behind the driver's shoulders. Then we shunted the rear wheels back with a big bellhousing to make a long wheelbase to try to get a decent weight distribution."

There were advantages to the V12, however. An engine with a 60-degree vee angle was tall and therefore top heavy, but it was also narrow in shorn down form. That allowed Southgate to go to town on the aerodynamics, something he considered to be one of the weak points of Porsche's all-conquering 956/962 Group C design powered by a flat-six turbo engine.

"We made the engine narrow so we could run ruddy big [ground-effect] tunnels down the side," he explains. "There was a big flange for the bellhousing that was part of the block, so I bandsawed that off. The starter motor was on the side and we moved that to the front to get it clear of the tunnels."

"Maxing out the downforce" was Southgate's mantra in the design of the XJR-6. There was no frame around the engine: it ran as a stressed member, the loads taken through the sump and the cam covers, with only a couple of stay bars for support. The uprights and spring damper

units at the rear were enclosed within the wheels. "I stuffed everything inside the wheel, which meant the tunnels could go right up to the inside of the tyres," he says.

The TWR design team, with Kiwi Allan Scott heading up engine development, also got the V12 as low as possible. Southgate talks about the sump being little more than a flat plate. Charlie Bamber, a long-time member of the TWR engine department, reckons, "It did have a bit of depth to it – but I wouldn't say more than an inch."

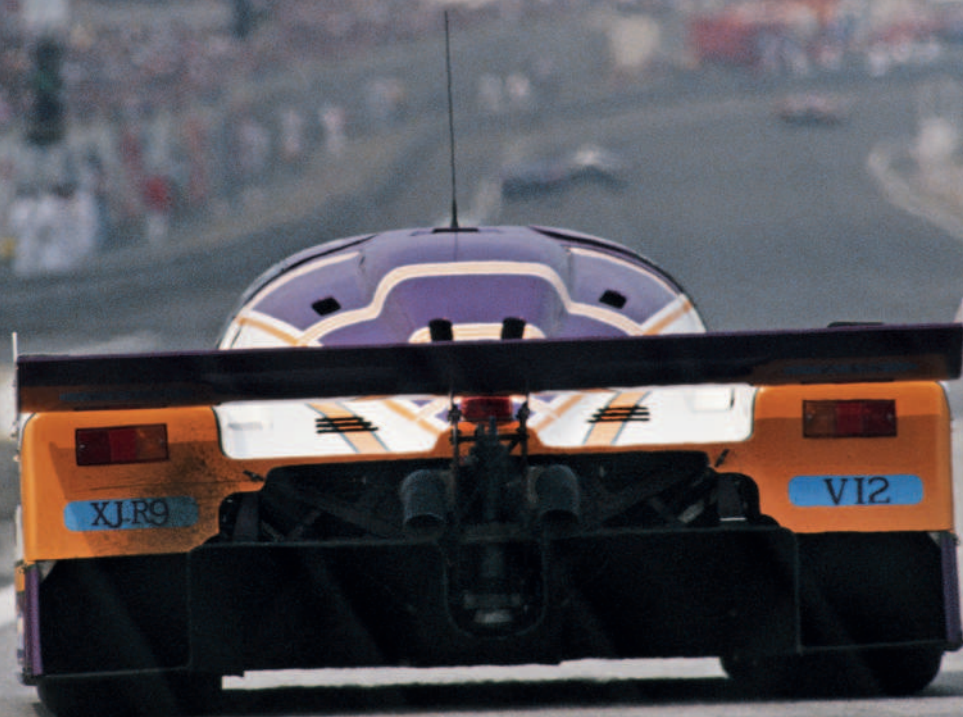
**"We made the engine narrow so we could run big tunnels down the side"**

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The XJR-6 might have ended up with an even heavier version of the V12. TWR's toe into the sports car waters with Jaguar had on development a four-valve head for the V12. It was this engine that sat in the back of the XJR-5 TWR tested early in '85. This was based on a casting produced by Jaguar as a design study, which Bamber remembers as "not being fit for purpose". It was abandoned as the first XJR-6 started to come together in the summer of 1985. The idea of going to Le Mans – with either the 5 or the 6 – had been abandoned and the bespoke TWR car was given a race debut at the Mosport round of the World Endurance Championship in August.

One of the two cars entered in Canada led on its debut, the other finished a delayed third, limping home on 11 cylinders. At the end of the year, Jan Lammers, John Nielsen and Mike Thackwell finished second and on the same lap as the winning factory Porsche 962C at the Shah Alam circuit in Malaysia. Jaguar had to wait only two more races to record its first world championship sports car victory since 1957 in the second round of the renamed World Sports-Prototype

The Dumfries/Lammers/Wallace XJR-9 LM heading for victory at Le Mans '88, ending Porsche's seven-year winning streak





Championship in 1986. Derek Warwick and Eddie Cheever triumphed on home ground for the marque in the Silverstone 1000Kms, now with the XJR-6s running in the colours of Silk Cut cigarettes.

Jaguar didn't win again that year, though it did lead multiple races. Warwick took another four podiums over the season and was briefly declared champion. He was initially classified second with Cheever at the finale at Fuji, but when a timing error was discovered they were demoted to third. That pushed the Briton down in the points table behind Porsche factory drivers Derek Bell - who ended up as champion courtesy of a bizarre tie-break rule - and Hans Stuck.

Jaguar took both drivers' and teams' titles the following year. Brazilian Raul Boesel was crowned champion ahead of a trio of other TWR drivers as the Jaguar XJR-8, an evolution of the 6, won all but two of the 10 races. It is only a matter of record that the Porsche factory team wasn't present after the summer as its focus turned to CART single-seaters in North America.

One of the two races Jaguar didn't win was the big one at Le Mans. It put that right




The XJR-6 recorded a single win in the 1986 WSPC; flat-six Porsches accounted for seven

the following year with an XJR-9 driven by Jan Lammers, Andy Wallace and Johnny Dumfries. Less than six months earlier a Jag had won at Daytona on the debut of a new TWR North American operation. Martin Brundle gave the team a second world title as the Jags won six of the 11 races. There was another 24-hour double in 1990, too, Brundle, John Nielsen and Price Cobb claiming the victory laurels at Le Mans.

All these successes were achieved with an ageing engine boasting only two valves

per cylinder, one that increased in capacity from 6.2 litres to 7.4 over the life of the TWR Jaguar programme. That was the beauty of Group C. The rules were designed to be inclusive, to encourage multiple makers by limiting performance with a fuel allowance that stood at 510 litres for every 1000km in the distance races and at 2550 litres at Le Mans by the time TWR arrived in 1985.

"We got some very good power figures for a two-valve engine and the brake specific fuel consumption of any well-tuned engine should be similar," says Bamber. "With 12 cylinders we also have the capability to run the engine very lean. If you have two engines with 600bhp, a six-cylinder and a 12-cylinder, one of those you are going to be able to run leaner without damaging it. And that's the one with the most cylinders."

There was another dabble with a 48-valve head for the V12, a 'Jaguar' turbo developed out of the Metro 6R4 rally engine arrived in 1989 and then the 3.5-litre Group C rulebook resulted in the XJR-14 powered by a re-badged Cosworth HB engine in '91. But TWR's weapon of choice for the enduros always remained that hulking great V12. 

## When V12s ruled La Sarthe

For four years Audi and Peugeot dozen-pot diesels duked it out

The V12 had one last hurrah in sports car racing as the noughties drew to a close. Yet the powerplants that won the Le Mans 24 Hours four years on the trot from 2006 to 2009 weren't ear-tingling screamers. Fans awaiting the arrival of a new breed of prototype were greeted by the rap, tap, tap of the front splitter on the track surface rather than a sonorous engine note. This was the era of the whispering turbodiesel.

Audi and Peugeot took up the challenge presented by the Automobile Club de l'Ouest when it opened up Le Mans and its associate series to diesels for 2004. Both opted for the V12 route for their turbodiesel LMP1 challengers in 2006 and '07 respectively. The reason? Conservatism.

Ulrich Baretzky, Audi Sport's long-time head of engines, admits that he "knew nothing about turbodiesels" when he and his team set out to exploit the rules. "The capacity limit was 5.5 litres and we were allowed 12 cylinders, so we went to the maximum: more cylinders meant less load on each. I was fighting my colleagues on the road car side who told me I had to do a cast-iron block otherwise the engine wouldn't last. But I said to them I would never, ever do a cast-iron race engine."

Peugeot's 908 was the last V12 to win at Le Mans. Above right, Audi's first V12 diesel



Peugeot's engine was similar in architecture, save for a 100-degree vee angle, to the Audi's 90. It contracted a specialist in diesel combustion who specified a certain cylinder bore, leading it down the same 12-pot route as its rival.

The Audi R10 TDI won on its debut at the Sebring 12 Hours in 2006 and followed it up with victory at Le Mans for Emanuele Pirro, Frank Biela and Marco Werner; and Peugeot won the opening two rounds of the 2007 Le Mans Series with its 908. When they met for the first time at Le Mans, the French claimed first blood in qualifying, but Audi made it two wins in a row with the same trio of drivers as 2006.

Peugeot made a big step for 2008, swapping from aluminium to steel pistons that gained it as



much as 100bhp. A Herculean drive by Tom Kristensen, Allan McNish and Dindo Capello, the R10's superior traction control and an overheating issue for the 908s allowed Audi to complete a hat-trick with its V12 turbodiesel.

In 2009, Peugeot notched up what stands as the last victory for a V12 at Le Mans. A switch to titanium conrods in '10 proved its undoing and Audi's R15-plus TDI with a V10 — and aluminium pistons — inherited the win.

What turned out to be the final battle of the turbodiesels was fought out in 2011. New rules had limited engine capacity to 3.7 litres, and Audi returned with a V6 and Peugeot with a V8.





## Colombo V12

(1947-65)

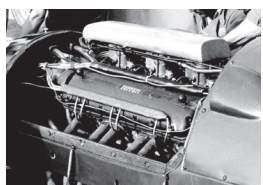
Though I lack the evidence to support it, when people reading this magazine think 'V12', I'd bet plenty more thought of this engine than any other. Gioacchino Colombo's motor was a masterpiece even by V12 standards, powering the vast majority of Ferrari's road and sports racing cars from the company inception in the late 1940s to the mid-1960s. Simple, ridiculously reliable but easily tuned, it started life with 1.5 litres in 1947 and ended it 20 years later with 3.3 litres, so stretchable that in all capacities from 2 litres to 3.3 litre it retained the same 58.8mm stroke. Think Testa Rossa, Tour de France, 166 MM, 250 GTO (below), 275 LM and so many others; this was the engine that powered Ferrari from newbie obscurity to global superstardom. Indeed its first and most recent Le Mans wins were both powered by it. And it didn't sound bad either...



## Lampredi V12

(1951-55)

Colombo's V12 was a great engine, but it never won a grand prix. However, the engine designed by his replacement Aurelio Lampredi did. And it won Le Mans, and it was used in road cars. So while the Colombo motor is Ferrari's most famous V12, it is Lampredi's that was its most versatile. Conceived with 3.3 litres, it grew until at 4.5 litres it possessed the power



in 1951 to stop the Alfa Romeo steamroller with its (Colombo-designed) 1.5-litre in its tracks. At 5 litres in 1954 it won Ferrari's second Le Mans. The following year it could be found under the bonnet of the 410 Superamerica. Big, brutal and brilliant to listen to.



## Ferrari 512/612/712

(1968-71)

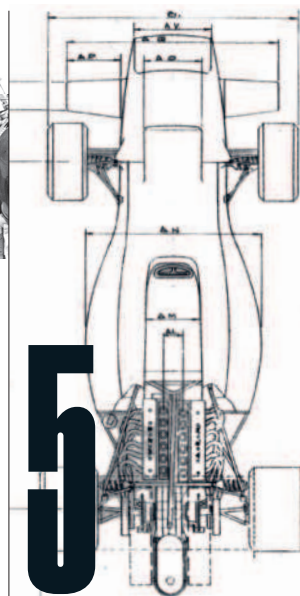
By the late 1960s Ferrari engines no longer had a single author, though if this one did, it would be Mauro Forghieri. The engine was conceived as a 6-litre V12 for Chris Amon's 1969 Can-Am campaign in which it showed some promise against the McLarens. A clutch of podiums resulted before the McLaren became uncatchable. The 7-litre 712 – still Ferrari's largest engine – fared less well in 1971. But it is best remembered as the 5-litre motor installed in the back of the 512S (below) as Ferrari's response to the Porsche 917. And, save for one win at Sebring, it failed. So why is it here? Because it's the quad cam 48-valve racing Ferrari V12 that gave voice to one of the most beautiful cars of all.



## Matra V12

(1968-74)

Matra built its first V12, the MS9, designed by Georges Martin (above) as a DFV-rivalling motor for the 1968 F1 season. It was such a dismal failure that even by the end of the season it was being phased out in favour of the DFV. Redesigned for 1970 it still struggled against the DFV and Ferrari's new flat 12, but started to show more promise in a sports car application. And while it was probably never as powerful as the Ferrari engine, it was stronger over distance, finally finding its happiest hunting ground on home soil where, strapped to the back of MS670, it scored a hat-trick of victories at Le Mans from 1972-74. But that's not why we remember it. Its fame endures because of all the great racing V12s, it was one designed neither in England or Italy that sounds the sweetest. Never heard one? Stop reading and get on YouTube.



## BRM V12

(1968-77)

BRM engines tended to be famous for all the wrong reasons: its V16 was hideously unreliable at first and almost impossible for a driver to manage, while its later H16 was complex, heavy and also unreliable. But its V12 was quite the reverse, an entirely conventional design that had a Formula 1 career lasting from 1968-77 – not bad when you consider it had been designed for sports car racing. Indeed it was only drafted into F1 when the H16 turned out to be a dead end. And in Tony Southgate's effective P153 it had the power to carry Pedro Rodríguez to victory at the pure power circuit that was the old Spa in 1970 (below), then win in Italy the following year in what would reign for years as the fastest grand prix ever run. The following year in rain in Monaco it would also win one of the slowest. Though it raced on, that would be the last win for this long-serving, underrated and sweet-sounding V12.



Earplugs at the ready for **Andrew Frankel's** top-10 rundown of V12 engines – an all-star cast featuring Ferrari, Aston Martin and BRM. Not 'arf, block pickers!





## McLaren F1 BMW V12

(1995-99)

The BMW S70/2 engine was never designed to be a racing unit, any more than was the McLaren F1 road car into which it was fitted. But a change in rules that made it possible for a car like the F1 to win Le Mans outright coupled with the resulting entreaties of customer race teams and the fact the road cars were selling far more slowly than intended made a race programme almost inevitable. And in racing S70/3 configuration it became as revered as it had been in the road car. Powerful, sonorous and incredibly reliable, it helped turn the F1 into the class of the field, taking four of the first five places at Le Mans in 1995, including the top step. McLaren F1 teams took the BPR Global championship in both 1995 and 1996; thereafter the engine found a second lease of life in the back of the BMW LMP1 prototype (below), winning Le Mans again in 1999. Not bad for a road car motor...



## Mercedes-Benz M154/ M163 V12

(1938-39)

New rules for  
grand prix racing

In 1938 forced a 3-litre capacity upon Mercedes-Benz. No longer could it rely on displacement for power as it had with the 5.6-litre W125, so now it went for cylinders, the old straight eight replaced by a brand new V12. Initially designated M154 for 1938 this engine had four overhead camshafts, four valves per cylinder and was rated at a barely believable 474bhp at 8000rpm, a specific output of 158bhp per litre over 80 years ago, compared to 114bhp per litre for the W125. The following year myriad modifications to the engine resulted in a small increase in power to 480bhp, but fully 500rpm further down the rev range, transforming the engine's reliability. The result was a car so fast it was beaten just once in each of the seasons it raced, delivering the European Drivers' Championship to Rudi Caracciola in 1938. But for the outbreak of war, the same title would have been awarded to Hermann Lang (below) the following year.



## Eagle-Weslake V12

(1967-68)

It is commonly, but wrongly, supposed that the Cosworth DFV was the most powerful engine on the F1 grid from the moment it arrived in 1967. In fact this was rarely, if ever, the case throughout its illustrious career. One engine that trumped it was the V12 used by Dan Gurney in the back of his Eagle to win that year's Belgian Grand Prix (above). The engine was designed by Aubrey Woods and Harry Weslake and originally intended for BRM, but when



the concept with its narrow angle cylinder heads was rejected, Dan Gurney showed an interest. Despite the whole thing being done on a shoestring budget, by the time Dan headed out to Spa it was developing 413bhp, making it arguably the most powerful engine on the grid. By the start of 1968 it was reputedly developing 442bhp but the money had run out, the car raced only sporadically and as the F1 world raced to adopt the light, affordable DFV, its era was over.



## Honda V12

(1964-65)

Honda, at the time a company far better known for motorcycles, produced its first V12 at the end of 1964, a jewel of a motor whose dozen 125cc cylinders produced 222bhp at 12,000rpm, just 1000rpm above its torque peak! It was reliable at 13,000rpm, red-lined at 14,000rpm and was once buzzed to 16,000rpm by Ronnie Bucknum without apparent injury. So if you're ever minded to ponder who made the most powerful engine of the 1.5-litre F1 era, be advised it was neither Coventry Climax nor BRM, nor even Ferrari. It was Honda. Success came at the last minute, Richie Ginther exploiting the Honda's fuel injection in the thin air of Mexico City to record his and Honda's first ever grand prix win (above), and the last of the formula in which it was designed to compete.



## Aston Martin V12

(2005-2011)

An engine originally designed by Ford, based on two Mondeo V6 motors that would go on to win back-to-back class wins at Le Mans in 2007 and 2008 in the front of an Aston Martin... The Aston Martin V12 may have had humble origins but Aston Martins raced successfully for years in the top category of GT racing, not just at places like Le Mans but also and for even longer at events like the Nürburgring 24 Hours. This was an engine of immense durability and longevity, first appearing in the aforementioned Ford concept car in 1996 yet still capable of powering a GT3 Vantage to fourth overall in the N24 some 22 years later. Nor should we forget its role in the back of the Lola-Aston Martin B08/60, sometimes referred to as the Aston Martin DBR1-2. It is too easy to forget that in an era dominated by diesel, this road car engine powered what was often the most successful of the petrol prototypes during 2010 (below) and 2011.





## FERRARI FLAT-12

Ferrari's flat-12 final flourish came in 1979. Gilles Villeneuve, here at the Dutch GP, would end the season second behind team-mate Jody Scheckter







# SOUND AND VISION



In the mid to late 1970s Ferrari painted the town red, with world titles for Niki Lauda and Jody Scheckter and an incredible 1-2 in '79. But as **Mark Hughes** reveals, a major part of that success was the flat-12 engine, which powered the Scuderia's 37 wins over 10 seasons





Ferrari's Mauro Forghieri, left, checks Niki Lauda's 3-litre engine before the 1977 Austrian Grand Prix. A majority of teams were using the Cosworth DFV V8 at this time. Right, the flat arrangement was partly conceived with aviation in mind



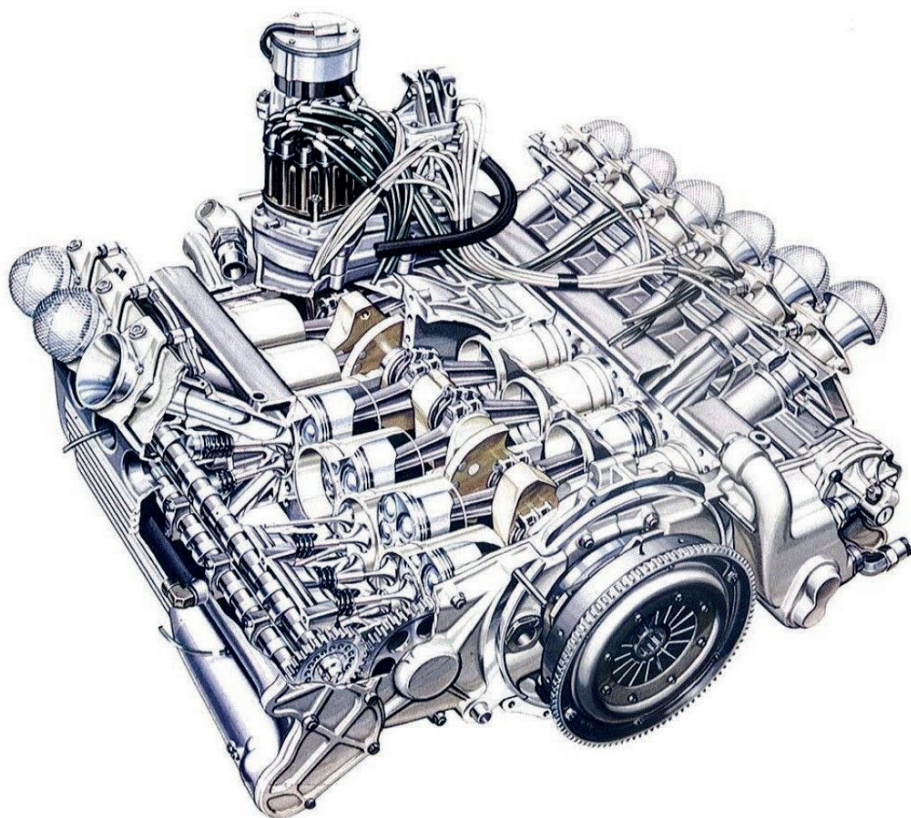
**T**HE BEST, MOST SUCCESSFUL V12 in F1 history was actually a flat one, Mauro Forghieri's 180-degree masterpiece for Ferrari, which served the team from the beginning of 1970 to the end of 1980. It was the foundation of the team's glorious period of success in the mid to late '70s, powering the Scuderia to Constructors' titles in 1975, '76, '77 and '79 and making world champions out of Niki Lauda and Jody Scheckter. Other legends to have won grands prix with it comprise Jacky Ickx, Clay Regazzoni, Mario Andretti, Carlos Reutemann and Gilles Villeneuve. Quite a roll call.

Its distinctive blare trailed the triumphant Ickx-Regazzoni 1-2 on its first win in Austria 1970 just as it did its last one, Villeneuve's wet weather demonstration at Watkins Glen '79. They bookended 35 other victories. Good power, beautiful torque delivery, eventual rock-solid reliability - and a layout that conferred both a lower centre of gravity and a better airflow to the rear wing than the rival Cosworth DFV V8 cars. This and a weight penalty of just 15kg over the DFV despite four more cylinders, pistons, conrods, greater length, etc, made it a minor miracle of engineering for its time.

It was the first Fiat-funded F1 Ferrari engine and there is a significance to that. The late '60s had been a financial struggle for an independent Ferrari. It was putting a sheen upon a tired old structure with long-in-the-tooth V12 engines which dated back to the 1950s. Well down on power to the DFVs, way too heavy and requiring ridiculous quantities of cooling, it was only Forghieri's great chassis and Chris Amon's driving genius that had kept them in play at all.

Forghieri had been badgering his boss and tormentor Enzo Ferrari to give him an R&D department to create a modern Ferrari engine ever since he first set eyes on the Cosworth DFV in 1967 and understood its implications. "But Mr Ferrari faced certain financial restrictions at the time," recounted Forghieri in 2013. "So I had said before the 1968 season, 'OK, well if we can't do a new engine can we at least just concentrate on F1? Rather than F1, sports cars, Can-Am, F2, even hillclimbs. If we do this, I am sure we can win at least three grands prix.' Unfortunately, for a number of reasons we won only once and so at the end of the season I offered my resignation."

But the shrewd Old Man wasn't ready to receive it. "He said, 'No, you are not resigning from anything. You will go to Modena and do what you ask about making a modern engine.' The Fiat money was coming and the whole company was now able to race in a much more serious way." Forghieri spent 1969 not at the race track, but secreted away with five other



**"Good power, beautiful torque delivery, eventual reliability"**

engineers at the base in Modena, remote from the politics of the main factory. There they created the beautiful 1970 Ferrari 312B, at the heart of which was Forghieri's flat-12. "I was so very, very, very lucky with the draughtsmen and technicians I had around me - people like Franco Rocchi, of a high calibre that I could sit and discuss my ideas with. We were more than the sum of our totals."

What the DFV had made plain to Forghieri was that there were enormous gains to be made from minimising oil pumping losses and maximising the strength of combustion even if it meant compromise on total flow capacity. This informed his combustion chamber shape and valve angles and much time was spent on baffling the internals in a way which kept the oil flowing and not simply being churned. The engine even incorporated the DFV's 'tumble swirl' trick whereby the inlet port pointed the mixture at the opposite cylinder wall at an angle which induced a swirling motion, making the mixture more volatile.

Internally, it represented the new school of DFV thinking and made Matra's V12 - conceptually a Ferrari V12 copy, though very different in detail - outmoded in its philosophies of combustion and internal

pumping efficiencies. Not to mention size and weight - the Matra weighed in at 26kg more than the flat-12. The BRM V12 of the time was even lighter than the Ferrari, but only because it had been under-specced on bearing sizes, which made it unreliable and unable to reach the sort of revs or power of the Ferrari.

So even though the Ferrari flat-12 and DFV V8 were entirely different in layout and shape, internally Forghieri's motor shared much of the same thinking. By Forghieri's admission, the DFV was by far the most influential factor in his engine's design. The Cosworth needed less of everything - fuel, water, air, space - than existing designs despite delivering more grunt. But that was only partly because of its V8 layout. There was surely a way of combining that new thinking with more cylinders to make something even more potent.

Forghieri didn't want to throw out the 12-cylinder baby with the efficiency bathwater. He believed he could surpass the engine of his inspiration by a greater number of smaller cylinders which would be laid out to lower the centre of gravity height. There was more than just F1 thinking behind the 180-degree layout, as Forghieri revealed: "It was conceived also to be an aircraft engine. Ferrari had an ●





The Ferrari pit at a damp Zandvoort in 1971 with Clay Regazzoni in the car in discussion with Mauro Forghieri. Jacky Ickx, seated, was picking up tips – he went on to win the race. Right, Lauda's Ferrari flat-12, 1975. Far right, Ferrari's Alain Prost at practice at Suzuka in 1990; in the race he'd be cynically taken out by Ayrton Senna

agreement with the Franklin aircraft company to make an engine which could be incorporated into the wing. Franklin went into receivership and it never happened but that's where the idea of the flat layout came from. But it did bring the centre of gravity height down to around 3.5cm lower than a DFV." It also made for a bigger space beneath the rear wing's underside, potentially allowing it to work more powerfully.

"It is not a 'boxer' engine by the way," Forghieri stresses. "A boxer engine has each opposing piston moving away and towards the other on the same throw. My engine retained the same sequence as a traditional V12 but the vee was laid out horizontally."

The advantages of a 12-cylinder over an eight are very real, but so are its disadvantages, and the technology of the time limited the full exploitation of the former. The 3-litre capacity limit of the formula meant each cylinder was only 250cc (compared to 375cc for an eight). This drastically reduces the peak loadings on the rev-limiting components (pistons, rods, bearings and crank), as the inertia loads increase in square to the engine speeds.

Also, because the smaller pistons are not absorbing as much heat, the bore size can be

increased and the stroke shortened, further reducing those stresses. At its 1970 introduction the flat-12's bore to stroke ratio was 61/39%. That of the DFV was a less favourable 57/43%.

But the greater engine speeds will demand more fuel, it will be bigger and heavier and its long, slim shape will be less conducive to being used as part of the structural strength of the car. The frictional losses will be greater because of the greater number of moving parts, although Forghieri minimised this penalty by ambitiously running just four main bearings (in bronze) – rather than the traditional 7 of a V12 – in which to carry the crankshaft. One of the keys to the motor's small weight penalty over the more compact DFV was the use of titanium conrods rather than the forged steel of the Cosworth. This was cutting-edge stuff at the time and the cause of many of the reliability problems suffered in testing which persuaded Chris Amon to leave at exactly the wrong moment.

"We stabilised the titanium by shot-peening – firing pellets of silicone at it, which caused it to harden," explained Forghieri, who was gutted to lose Amon's renowned testing skills.

Experimentation through the inaugural season with valve angles and sizes helped the

engine really start to show its potential, and by the season's second half it had a clear and decisive advantage even over the special development DFVs used by Jackie Stewart and Lotus, when it was revving up to 12,600rpm at which rate it was delivering 480bhp compared to 450 at 10,500rpm for the special DFVs.

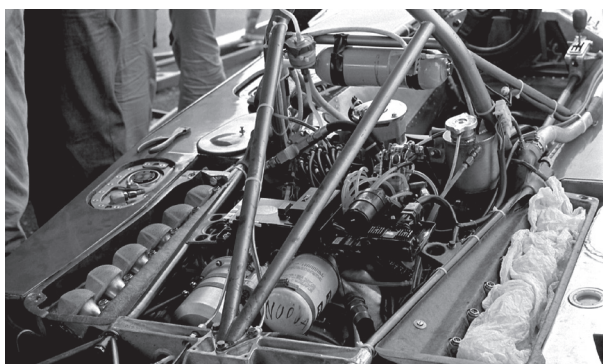
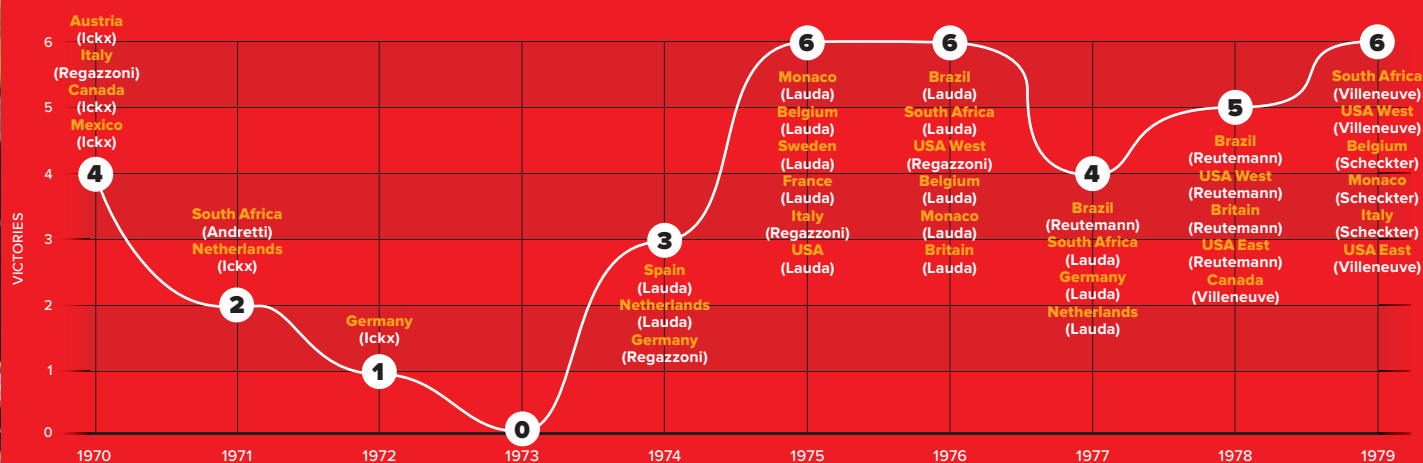
By the end of its life in 1980, the engine was delivering 515bhp at 12,300rpm at a time when a top DFV was good for around 500bhp at 11,200rpm. The relatively gentle power creep in a decade of competition gives one of the clues to the two key limitations of the time: valve springs and ignition. Before the advent of pneumatic valves (introduced by Renault in 1986) engine designers were generally stuck at these sorts of engine speeds by the ability of the valve springs and the ignition pulses to keep up. Pneumatic valves and software-controlled electronic ignition would have allowed more of the 12 cylinder's potential to have been exploited. But that was some way off in the '70s.

The Ferrari typically needed around 20kg more fuel in the tank than a DFV car at the start of a race. Its power advantage over the best DFVs varied from year to year but was around 15-30bhp. At the upper end, that advantage was



## Ferrari flat-12 victory tally

Where the Scuderia's 37 victories arrived in the '70s



## "The DFV was the influential factor in Forghieri's design"

enough to cancel out the initial fuel weight disadvantage (which would lessen anyway through the course of the race). Factor then the aero and centre of gravity advantages and it can be appreciated that Forghieri got about as close as technology of the time allowed in clawing a small advantage for a 12-cylinder over the best V8. It was a remarkable piece of work and was only made obsolete by the innovation of ground effect, as its widely-splayed cylinder banks were in exactly the wrong place for maximum airflow through the sidepod venturis. Those of the DFV were perfectly placed, extending its life for a few years.

By the time of the next normally aspirated formula of 1989, the technologies were there to exploit more of the V12's potential over the V8. But there came the complicating advent of a perfect compromise between the two: the V10 as introduced by both Renault and Honda

for this formula. Forghieri was long gone from Ferrari but the team favoured a V12 for the new formula and it retained this layout for seven seasons - winning races with Nigel Mansell, Gerhard Berger and Jean Alesi and bringing Alain Prost close to the 1990 world title - before bowing to the inevitable and making a V10 in time for Michael Schumacher's arrival.

The V10, using the same cylinder head design as the V12, required 10% less cooling for the same power delivered at lower revs, immediately lapped faster in the mule chassis and was 3.7mph faster down the straight, suggesting the V12 had a fundamental surfeit of moving parts, at least compared to a V10. As John Barnard, who drew up Ferrari's last V12 and its first V10, summarises in *The Perfect Car*, Nick Skeens' 2018 biography of the designer, "Advancing technology had led to ever lighter engines made of exotic alloys, ceramics and

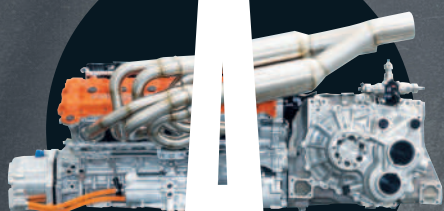
titanium, such that a contemporary 10-cylinder engine could now generate as much power as a V12 for less internal friction and weight."

But Schumacher, upon trying the by-then obsolete Ferrari V12 in testing, felt it was better than the Ford Cosworth HB V8 with which he'd just won the championship at Benetton. "He commented that he could have won the '95 title easier with the '95 Ferrari than with the Benetton," recalled Barnard. "Gerhard Berger and Jean Alesi hadn't liked the way the internal friction of the V12 meant the revs dropped like a stone when you lifted your foot off the gas, making the back of the car feel loose on corner entry... but Schumacher loved the way it did that. In fast corners he was uniquely able to finesse the rear end drift with rapid micro-touches on the accelerator, using the engine braking to create the perfect grip for the bend."

Even so, the V10 was better - but there was a title-winning V12 in that era: Ayrton Senna won the '91 championship with a McLaren powered by Honda's V12 replacement for its V10 before pulling out at the end of that year. Hindsight says it was a retrograde step, but still better than the opposition. It won despite being a V12, not because of. ●



# OUT WITH A BANG



You won't find many members of Extinction Rebellion protesting to highlight the plight of the V12 engine.

**Andrew Frankel** is with the last of the breed – the Gordon Murray T.50 and Aston Martin Valkyrie – before they join the choir invisible





**M**AKE NO MISTAKE, THE V12 engine is a dead man walking. For over 100 years and on both road and track we have marvelled to the sound of a dozen perfectly balanced cylinders and, when bonnets were lifted, thrilled to their sight too. To me there is no greater expression of what I love about engines than the sight of a Ferrari Testa Rossa V12, with its red cam covers sandwiching a regiment of twin-choke downdraught Webers.

But they're finished. Despite the fact that V12s are still used by Aston Martin, Bentley (if you count its strange W12 formation), BMW, Ferrari, Lamborghini, Mercedes-Benz and Rolls-Royce and with two more about to go into production - of which more in a minute - their days are numbered.

Of course, manufacturers like Ferrari and Lamborghini, which have built their reputations on the back of the V12, won't give you a precise sell-by date, but their future is simply not sustainable. These engines are magnificent dinosaurs, padding about the planet, watching the asteroid of electrification hurtle earthbound, knowing that nothing but extinction awaits. Will any still be here in 10 years? Not a chance.

So it says something for the human spirit that at least two brand new, designed-

from-scratch V12s are shortly to go into production. Both are built by Cosworth; one displaces 6.5 litres and is destined for the Formula 1-derived Aston Martin Valkyrie; the other a more modest 4 litres designed for Gordon Murray's McLaren F1-replacing T.50 supercar.

There are several interesting aspects to both engines. Most notably and despite the vast amounts of additional power and torque that would be available, neither is turbocharged. Yet both make full use of the V12's greatest traditional strength: yielding maximum power from any given capacity. In the Aston's case that's a nice round 1000bhp, while the T.50 has just 654bhp. But in fact it is Gordon Murray's motor that has the highest specific output, each litre providing a motorcycle-like 164bhp, compared to the Aston's 154bhp. However while the Aston engine sounds quite peaky, requiring all of 7000rpm before it'll yield its 545lb ft of torque, Gordon's car is playing a different game altogether, needing 9000rpm to deliver just 345lb ft of torque. The former will spin to 11,100rpm, the latter a dizzying 12,100rpm.

They can do this because both are unimaginably expensive, ultra-low-volume cars that are purely recreational in purpose and which will live as small parts of large collections and only be brought out, if at all, when conditions and the environment are exactly right for them.

But why did both companies choose a V12 configuration? For Aston Martin it wasn't actually an immediate choice. They looked briefly at a V8 and rather longer at a twin-turbo V6 but ultimately reached the same conclusion at which Gordon Murray arrived, albeit for slightly different reasons. Aston chose a V12 partly because, well, it's a V12, but also because its relatively narrow (65-degree) vee angle and absence of turbos, intercoolers and associated plumbing would provide as little impedance of the air flow under the car as possible, allowing downforce to be maximised. Gordon Murray chose 12 cylinders largely because he felt that it was the ultimate configuration for his ultimate road car.

Interesting that. Twelve cylinders, not 16. True, V16 road cars have not been around for quite as long as V12 road cars but they've still been built on and off for over 90 years. There's no specific engineering reason for it: a V16 is perfectly balanced so I think what we're seeing is the Goldilocks effect coming into play. Engines below a certain capacity don't gain enough in terms of additional



From top: Rolls-Royce Phantom's 6.75-litre V12; the hybrid Aston Martin Valkyrie can call on an electric boost

power over a V12 than they lose in terms of mechanical complexity, which is why the only 16-cylinder engine in production today is Bugatti's 8-litre monster used in the Chiron. That said, if you built, say, a 6-litre supercar engine with fewer than 12 cylinders, you might not be too bothered about the potential lost power, but some people will just feel a little short-changed.

It's the reason Mercedes-Benz keeps an ancient V12 for its Maybach limousine despite the fact its AMG V8 is a far more modern and better engine, capable of producing much more power. And it is known many Bentley customers will only choose the 12-cylinder motor, perhaps through fear of being trumped, regardless of its suitability. Rolls-Royce, since its rebirth 18 years ago, has only ever installed V12 engines below those imposing bonnets.

Simply put, and in the world of the petrol engine, even when a V12 may not be technically the best choice, it is still seen as such. It comes with an emotion dimension, a pedigree and class other configurations lack. But that world is perishing before our eyes. Internal combustion engines are shrinking, withering away and soon will be dead. And the V12 will be among the first to be officially listed as extinct. They are already some decades from their heyday and exist now more as curios, charming remnants of a time that has been, but is now almost gone. ○



Ferrari's 1962 V12-powered 330 TRI was the last front-engined car to win Le Mans. Left, the T.50



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Cue the Ennio Morricone  
soundtrack as we meet IndyCar's...

# YOUNG GUNS

Watch out, there's a new sheriff in town... In fact there are four. **Preston Lerner** witnesses IndyCar's high noon as youth, in the form of Colton Herta, Pato O'Ward, Alex Palou and Rinus VeeKay, run the old-timers out of Dodge



## INDYCAR POWER SHIFT

ALEX PALOU LOOKED LIKE A sitting duck. The IndyCar Series world had been shocked when Chip Ganassi Racing hired Palou after the little-known Spaniard's nondescript rookie season in 2020. Yet two weeks after turning 24, Palou qualified third during the season-opening Grand Prix of Alabama and controlled the race with a masterful blend of speed and fuel-conversation strategy.

Now, with the laps ticking down at Barber Motorsports Park, Palou was being hounded by past IndyCar champ Will Power, who still had plenty of push-to-pass boost in the bank, and right behind Power was six-time champ Scott Dixon. Further complicating matters, Palou was being held up by slower drivers who were determined to remain on the lead lap.

Inside the cockpit, Palou's heart rate spiked. "Even if you are P1 on the last lap, there are so many things that can happen to ruin your race," he says. "I was convinced that we were doing a good job, but until the

chequered flag was down, I never believed that we were going to win that race."

Believe it. Palou held Power off by 0.416sec. "Chequered flag, baby," Ganassi Racing general manager Mike Hull said over the radio. "You are an IndyCar winner."

With this victory, Palou heralded a new paradigm that flips the cynical adage 'old age and treachery will always beat youth and exuberance' on its head. With the season almost complete, the biggest news in IndyCar has been the sustained excellence of a group of young drivers who could be known collectively as the Fab Four - Palou, 22-year-old Pato O'Ward, 21-year-old Colton Herta and Rinus VeeKay, who has just turned 21.

In recent years, IndyCar has been dominated by grizzled veterans like Dixon (age 41), Power (40) and Simon Pagenaud (37), plus the next generation - Josef Newgarden, Alexander Rossi and Graham Rahal, et al - who are pushing 30 or already there. But one week after Palou's win at Barber, Herta went flag to flag at St Petersburg. A week after that, in the second race of the doubleheader at Texas



"In recent years, IndyCar has been dominated by grizzled vererans"





Left, Álex Palou, in just his second IndyCar season, got off to winning ways at the 2021 opener at Alabama. Above: in June at Detroit Arrow McLaren SP's Pato O'Ward scored a second IndyCar victory. Below: Colton Herta takes the flag at the St Petersburg Grand Prix. Bottom: You got any ID? – Pato O'Ward. Main image: Rinus VeeKay (21) led for 32 laps in this year's Indy 500



Motor Speedway, O'Ward scored his maiden victory. The next event, on the road course at the Indianapolis Motor Speedway, produced another first-time winner in VeeKay. Going into the summer break, the Fab Four improbably stood at positions 1-2-7-8 in the title hunt.

"Newgarden, Will Power, Scott Dixon - these guys are perennial favourites because they've still got tons of speed, and they've got experience on their side," says Bryan Herta, Colton's father and himself a four-time IndyCar winner. "But these young guys are coming in and rattling cages. Is it a changing of the guard or are the older guys going to be able to respond to the challenge?"

The young guns all arrived on the doorstep of Beatles-like stardom by different roads. Colton Herta is the best known because of his name, because of his success and because he's been on the IndyCar scene for so long. His parents took him to the Long Beach Grand Prix, where his father was racing, when he was only three weeks old, and racetracks have been his favourite place to hang out all his life.

"Ever since I can remember, when I was three or four years old, I always wanted to drive race cars," he says. "I started testing go-karts when I was five, and I was racing when I was six. I never really saw it as a profession. I looked at it as something that was really fun to do."

Herta spent two successful seasons in Europe - often duelling with then Carlin team-mate Lando Norris in British Formula 3 and 4 - before returning to the States. After two strong years in Indy Lights, he graduated to IndyCar. At Circuit of the Americas in 2019, in his third race in the series, he became the youngest winner in IndyCar history. At the time, he barely looked old enough to take a date to the high school prom.

O'Ward has been the most spectacular of the quartet, but also the unluckiest. Born in Mexico and schooled in Texas, he's got the fastest hands this side of a Wild West gunslinger. At 17, he was the youngest-ever winner in the PC class at Daytona and Sebring, then decisively beat Herta to win the Indy Lights championship in 2018. This earned him a slot on the Red Bull Junior





Smoking-hot O'Ward has been promised a Formula 1 tyre test by McLaren Racing CEO Zak Brown



team, with the expectation of moving to Formula 1 in 2020. But after racing briefly in Japan - against Palou - there was a problem with his Superlicence, and he returned home to the States.

Plans to move up to IndyCar were scuppered when his sponsorship fell through, and Herta got the ride instead. But O'Ward was hired by the newly formed Arrow McLaren SP operation in 2020, and he rewarded the team with four podiums, fourth place in the year-end standings and a highlight reel of in-car footage featuring a series of implausible saves.

O'Ward's convincing win this year at Texas guaranteed him a test in a McLaren F1 car. "See you in Abu Dhabi later this year!" McLaren Racing CEO Zak Brown tweeted moments after the race.

Palou is the most battle-tested, globally, and probably the smoothest driver of the up-and-comers. His race log includes GP3, Formula 3, Formula 2 and Super GT and Super Formula in Japan. He was pleasantly surprised when Honda arranged an IndyCar test at Mid-Ohio with Dale Coyne Racing, and he was thrilled when his performance led to a full-time gig in 2020. Although his results were lacklustre, he showed enough speed to inspire Ganassi to hire him for 2021.

## "Across the globe teenagers are flooding into junior series"

This year, he has barely put a foot wrong, and his second win of the season, at Road America, vaulted him to the top of the points standings. But the Indy 500 was the race that got away; he was passed by Hélio Castroneves with two laps to go and finished second by a scant 0.4928sec. "We had the fastest car," Palou says. "But I had never led an oval race before, and I didn't manage the traffic as well as I could have. I was figuring things out while I was racing."

VeeKay - real name: van Kalmthout - has been the wild card. The son of a Dutch car dealer who raced in the Formula Ford Festival against Jenson Button and Danica

Patrick, VeeKay set his sights on IndyCar after he was discovered by Simon Pagenaud at a kart race. He quickly worked his way up the 'Road to Indy' ladder in the States and landed a ride with Ed Carpenter Racing for the 2020 season.

His first race, at Texas, was an everything-that-can-go-wrong-will-go-wrong nightmare. VeeKay crashed during practice, missed qualifying, then crashed again early in the race, taking out an innocent Palou. "I felt terrible," VeeKay says. "It was the worst debut you could have had." But he rebounded with a fifth-place finish in his next race, at Indianapolis, and ultimately earned Rookie of the Year honours. His win at Indy this season was the team's first victory in five years. "We had a great strategy, and the car was incredible," he says.

IndyCar isn't the only series where young drivers are setting new standards. Across the globe, teenagers are flooding into junior series, and twentysomethings are finding their way to the front of grids at the highest levels. In F1, for example, Norris, Yuki Tsunoda, George Russell, Lance Stroll, Mick Schumacher, Charles Leclerc and Nikita Mazepin are all under 24. So is Max Verstappen, who already has six full seasons - and 17 wins - under his belt. ◻





## Alex Palou

**Age:** 24

**Born:** Barcelona, Spain

**Team:** Chip Ganassi

**IndyCar debut:**

Texas, 2020 (23rd)

**First IndyCar victory:**

Alabama, 2021

**Highest season position:**

16th (2020)

**Career:** Open-wheel racing since 2014; one IndyCar podium in 2020



## Colton Herta

**Age:** 21

**Born:** California, US

**Team:** Andretti Autosport

**IndyCar debut:**

Sonoma, 2018 (20th)

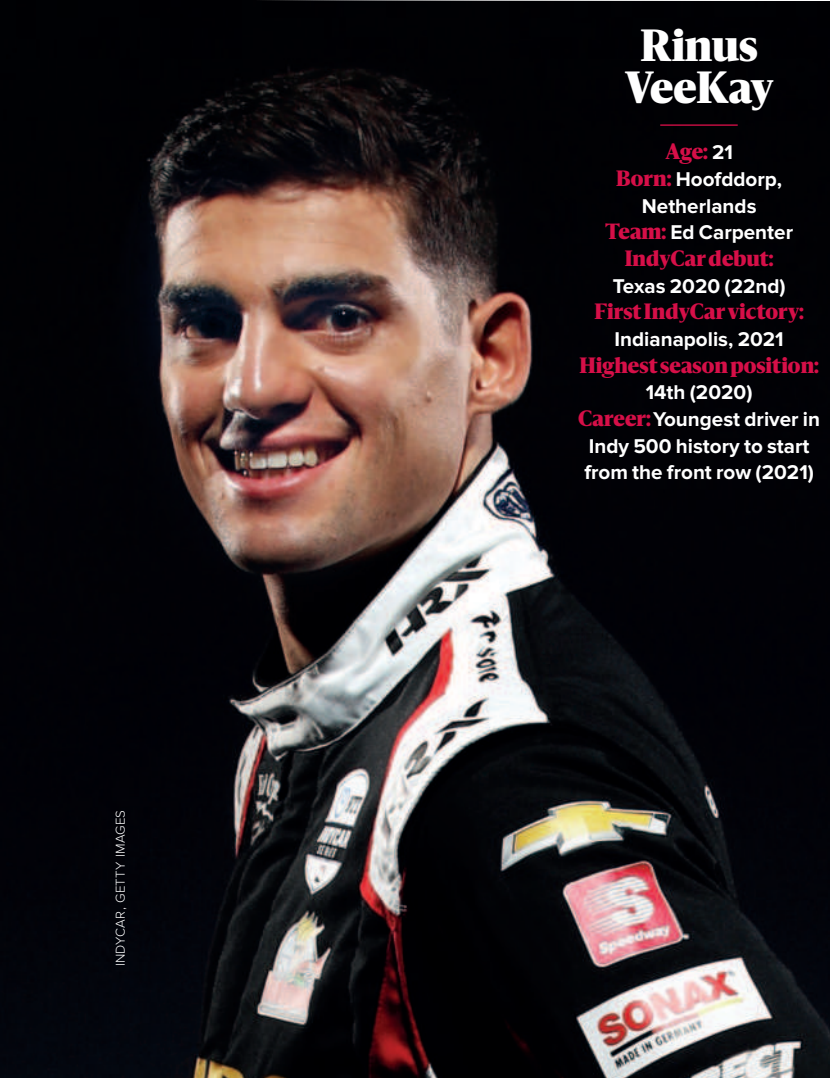
**First IndyCar victory:**

Circuit of the Americas, 2019

**Highest season position:**

3rd (2020)

**Career:** First IndyCar driver born in 2000s; race winner at 18 years 359 days old



## Rinus VeeKay

**Age:** 21

**Born:** Hoofddorp, Netherlands

**Team:** Ed Carpenter

**IndyCar debut:**

Texas 2020 (22nd)

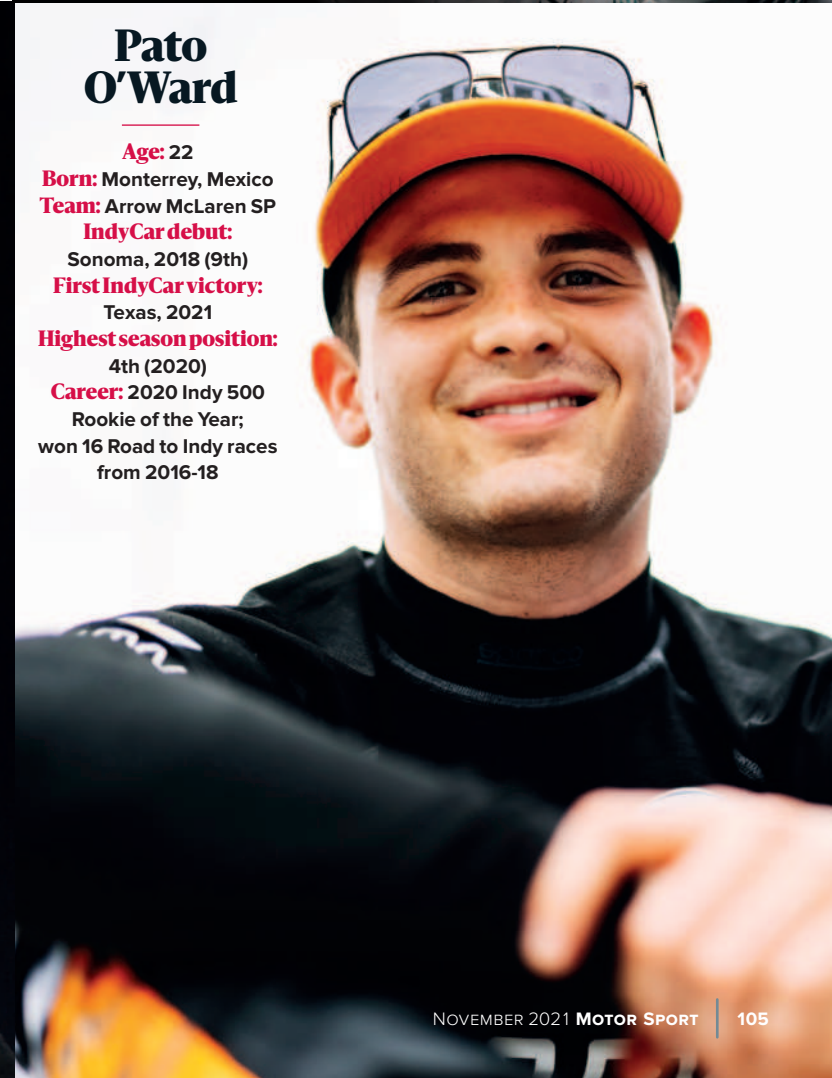
**First IndyCar victory:**

Indianapolis, 2021

**Highest season position:**

14th (2020)

**Career:** Youngest driver in Indy 500 history to start from the front row (2021)



## Pato O'Ward

**Age:** 22

**Born:** Monterrey, Mexico

**Team:** Arrow McLaren SP

**IndyCar debut:**

Sonoma, 2018 (9th)

**First IndyCar victory:**

Texas, 2021

**Highest season position:**

4th (2020)

**Career:** 2020 Indy 500

Rookie of the Year;

won 16 Road to Indy races from 2016-18





The No10 of Chip Ganassi's Alex Palou in front of Scott Dixon at Texas in May. The age difference between the two drivers is 17 years



"The system is better today," Mario Andretti explains. "These youngsters have the opportunity to get into serious equipment a lot sooner. Look at my career. I had to cheat to start at 19. These days, you're almost a veteran at 19. Colton Herta, Pato O'Ward, those guys - they were champions in support series before they were even 20."

Once upon a time, it wasn't uncommon for drivers to begin racing when they were in their 20s. Pete Halsmer, who went on to a long and successful career in sports cars, was pushing 40 by the time he became a full-time professional. "I didn't know what I couldn't do, or I probably wouldn't have started," he says. "I like to say that you need a little bit of stupidity and a lot of persistence to be successful."

Of course, age alone isn't necessarily a barometer of experience. And it's in experience, ironically, where today's drivers outpace their counterparts of yesteryear.

## "The role of the drivers has changed. These days they're a cog"

"When I moved into Indycars, I had done less than 100 races in my entire life," says Bryan Herta. "And I was ahead of the curve because you'd couldn't even do your first lap in a race car until you were 18. Now, karting has become so professional that kids are advanced at seven, eight, nine, 10, 11 years old, and they're getting into cars at 12, 13, 14. By the time they're 18 or 19, they're so much better developed as athletes. If they have the talent and the opportunity, they're able to find success very quickly."

At the same time, the role of the drivers has changed over the years. In days gone by, they were rugged individuals who were expected to carry cars on their broad shoulders. These days, they're just a cog - granted, the most visible and important cog - in a complex machine with moving parts ranging from race strategists, tyre engineers and data-acquisition geeks to driver coaches, physios and nutritionists.

"There are better ways to prepare a driver these days," says 29-year-old IndyCar winner Felix Rosenqvist, who started racing in Formula Renault when he was 15. "When 'Uncle' Dixon was growing up, it was more about feel and trusting yourself. Now you have a lot of engineers and simulators that can help you."

It's impossible to overstate the importance of simulators to the development of modern drivers. For the record, most of them don't have access to the supercomputer-level sims used by manufacturers to develop and tune race cars, and the notion that race cars drive like video games is a myth. But there's no question that off-the-shelf programs running on consoles and PCs have made racing more accessible - and comprehensible - to younger would-be Lewis Hamiltons.

"My generation grew up with video games, and I was doing racing games on the PlayStation when I was eight years old," VeeKay says. "So I think that makes the actual Chevy simulator easier for us because it feels more natural, where I know Will Power told me he kind of had to get used to driving on the simulator."

Andretti is a perfect example. Although he was renowned for his ability to drive just about anything just about anywhere, he has trouble keeping a digital car on a virtual track. "I have a simulator in the house, and it pisses me off," he says. "The more experience you have with the real thing, the more you hate the freaking simulators. When I really want to hustle the car, the freaking thing just crashes."

Youth will be served, as the saying goes. So at a certain level, the success of the Fab Four is just natural selection asserting itself. As Rosenqvist puts it: "When I was a kid, I was following freestyle motocross, and only one guy could do a backflip. Now, like every kid can do a backflip in his backyard. That goes for every sport. I think, naturally, every generation of driver will be quicker."

Age is an easy metric to wrap your head around. But what does it matter, really, if a driver wins a championship at 20 or 30 - or 40, in Dixon's case? The most important measure is talent, and that's much harder to calibrate. Andretti has seen 60 years of phenoms come and go, and he knows that the only surefire yardstick is performance over time. "There are talents, and there are special talents," he says, "and special talents are rare then and now."

Check back in 10 years to see if Herta, O'Ward, VeeKay and Palou are remembered like John, Paul, Ringo and George. ●



**The Fab Four, from top: Herta, VeeKay, O'Ward and Palou. Our twentysomethings are all title contenders although the old guard is digging deep to take the season to the final race. As we went to press, Palou had not fallen below third place in the 2021 ranking, while Chip Ganassi had three drivers in with a chance of championship success - Palou, Dixon and Marcus Ericsson... and there are no team orders**



# ARCTIC





# MONKEYS

Lining up in some of the most inhospitable locations on the planet, Extreme E is motor sport with an environmental message. **Adam Hay-Nicholls** travelled to the frozen wilderness of Greenland to find out what all the noise (or lack of it) is about







Far left: the Arctic X Prix final with Andretti United, Rosberg X Racing and JBXE bouncing across the tundra. Above left: Extreme E CEO Alejandro Agag with the UN's Christiana Figueres. Left: steady on there, Stéphane Sarrazin



Above: Russell Glacier, east of Kangerlussuaq. Right: more air, this time from JBXE's Odyssey 21. Below right: Johan Kristoffersson won the previous Desert and Ocean races alongside Molly Taylor. Far right: and you thought Brands Hatch was tough...





**G**REENLAND LOOKS BOTH familiar and otherworldly. Mountains soar above the green and reddish-brown tundra and crystal-clear lakes, similar to the landscape of the Peak District, the Highlands, or the west coast of Ireland. Pan around, though, and you're suddenly confronted by a gigantic and sheer wall of ice that looks like it's been plonked there via a movie director's CGI.

This is the scene for Extreme E's Arctic X Prix. The nearest settlement is Kangerlussuaq, towards the bottom of this vast country's west coast. A colourful jumble of low-rises with a population of just 508, built around an airport, this is, in fact, the main transport hub for the whole of Greenland. Between World War II and the end of the Cold War, this was a US Air Force base. Beside the road out of town is the wreckage of a Lockheed T-33 jet which crashed in 1968 and has never been cleared away.

Extreme E's drivers spent the August race week aboard the championship's passenger-cargo-research vessel, the *St Helena*, which was floating on the Kangerlussuaq Fjord, while the mechanics and media stayed in former USAF barracks. That is except for the first night, when a group of us joined Chip Ganassi's Kyle LeDuc and Sara Price camping on the Russell Glacier.

At how many races does one find drivers tiptoeing past perilous crevasses, erecting tents

in the wind and rain-lashed dead of night, and sleeping on ice under the Northern Lights? I applauded them for their adventurousness, though Price admitted, "We were told this was going to be glamping." It was not. The Californian dirt ace managed to put her neck out and bruise her posterior by slipping over, and then melted her shoelaces while drying her feet on a gas fire. This is not normal race preparation, but then there's nothing normal about Extreme E.

Extreme E, or XE for short, is like *Mad Max* meets *The Blue Planet*. Imagine Formula 1 with Sir David Attenborough in the commentary box and you get the idea. This unique electric rally series is designed to draw attention to the climate emergency and show what electric vehicles can do.

Spanish politician turned motor racing entrepreneur Alejandro Agag has followed up the Formula E electric single-seater championship he established in 2014 with this even more ambitious brainwave. He's the modern day Bernie Ecclestone, with a dash of Simon Cowell. Entertainment is at the heart of the concept. The inaugural race, in Saudi Arabia's spectacular Al Ula desert, was watched by 18.7 million and the following race, up the coast from Dakar, was broadcast to even more.

The first instalment brought attention to desertification and the plight of Red Sea turtles, while Senegal concentrated on plastic pollution and XE is funding the planting of a million carbon-capturing mangroves.

Of all the locations on the championship's calendar, Greenland is ground zero for the most urgent issue XE seeks to highlight; the melting of the ice caps, and how this endangers life on our planet. The ice sheet on which we camped has dropped 180m in height in a decade. Billions of tonnes of ice melts every day. And it's not meant to rain here, but it did. It's easy to be cynical about EVs ripping through tortured landscapes. The series' carbon footprint is, inevitably, greater than if everyone stayed at home but, as Agag likes to say, "You can't make an omelette without breaking eggs."

XE largely discourages spectators, but there is a hospitality tent and in Greenland it hosted Christiana Figueres who, in her role as United Nations executive secretary on climate change, was the main author of the 2015 Paris Agreement. I asked for her views on the need to turn petrolheads like me into electroheads. "The transport sector is responsible for roughly 30% of the world's carbon emissions," she explained. "We have to stop transporting ourselves in a polluting way, and this is a

"The ice sheet on which we are camped has dropped 180m in a decade"



A flip for Molly Taylor but miraculously she landed back on her wheels. Below: the on-land paddock, Extreme E-style





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The most unlikely venue for a motor race but the setting made a profound impression on some of the drivers. Below: the car used by all the teams has faced teething problems

very important example of how you can push those boundaries with electric SUVs. We need catalysts to spark changes in technology and behaviour. There's no doubt that motor sport is exciting and has many fans. We need to bring all of those people on the same journey." Is having people like Lewis Hamilton and Nico Rosberg speaking out about climate change a game-changer? "Yes it is, because not only do they command public attention, they're authoritative voices. They're willing to stand on their fossil fuel legacy and move forward. They're saying that was a moment in time and now we're stepping into the future."

Rosberg and Hamilton both own XE teams, as does Jenson Button. JB tells me the green element was a major draw. "I have two little ones, and your views change. I've always lived in the moment, but when you have kids you think about what you're leaving behind."

Jenson was behind the wheel in Saudi, found the car too unpredictable for his liking, and handed driving duties over to Swede Kevin Hansen from Senegal onwards. Kevin is also passionate about the series' wider aims and, along with most other drivers, likes to post eco-themed content on his social media channels. "We all need to share our story. We're racing in Greenland; an incredible location which is suffering like crazy. People that ignore that are the problem. To be here is pretty life-changing, I must say. One of the best aspects of this series is we really get to experience the locations. That doesn't happen with World Rallycross, where we go to WASP-y countries and just race. Here, we see the reality of the world, we're not hiding in our bubbles."

Diversity is also at the core of XE, with each team running a male and a female driver; the first time this has been mandated in motor

sport. The women competing include 23-year-old Catie Munnings from Kent. "Normally we girls are all spread across the world in various championships, so it's really good for so many of us to come together and encourage each other," says Catie. The men include bona fide rally greats Sébastien Loeb and Carlos Sainz.

There are barely any roads in Greenland, and the Arctic X Prix is the first motor race it's ever hosted. Known as the Ice Road, the gravel ribbon from Kangerlussuaq to the glacier is the longest in the country at 30 miles, and it passes the race site where the drivers battled across the plains from which the ice sheet has retreated. In its place is a varied surface of light grey sand, shale, grit and rock. The five-mile course required precision and bravery, as well as gambling one's steering arms and wheel rims

when it came to taking on the boulders of the so-called 'rock garden'.

At first glance, the drivers declared it the best circuit the championship has visited so far. Each session comprises two laps - one for each team-mate - with qualifying and three shoot-out races leading to a five-car final.

It was hoped that the much lower temperatures in Greenland would allow the cars' batteries to run at maximum power. But it didn't work out like that.

It's easier to list the teams that didn't have a technical issue in the qualifying sessions on Saturday: X44 and Acciona Sainz. The other teams all experienced stoppages, resulting from suspension failures, punctures and motor cut-outs which are still being diagnosed by the constructor of these spec-series machines, Spark Racing Technology, and battery supplier Williams Advanced Engineering.

Christened the Odyssey 21, we've yet to see anything like the Extreme E machine's full potential. It's not sufficiently robust, and the overheating batteries had to be wound-down from 275kW to 200kW, the lowest setting of

"One of the best aspects is we really get to experience the locations"







Champagne on ice: a win for British driver Catie Munnings of Andretti United and her Swedish team-mate Timmy Hansen

the season yet. The dual-motor machine should be capable of running at 400kW (536bhp). Drivers and teams are grumbling about reliability and questioning the price of parts.

“We are learning every race and there are always new things,” said Carlos Sainz. “I think if I were a little younger and less patient, I would be more in the air [angry] and not so much in control as I am now. Obviously [the technical partners] need to raise their game.”

Rosberg X Racing’s Molly Taylor managed to flip her car which, luckily, landed on its wheels and she was able to drive on with barely any delay and complete her lap. “The track is getting destroyed,” noted Munnings, “it’s so rough. It’s just about survival now.”

Officials changed the course overnight to avoid some of the most savage ruts as well as reduce the mileage on the batteries to curb the temperatures. The results on Sunday were not perfect - Veloce, Ganassi and Xite all suffered breakages - but there was close racing and thrilling victories, with Loeb and Munnings bringing home their X44 and Andretti United cars first in semi-finals one and two respectively. Special mention to Stéphane Sarrazin who

“Sarrazin got so much air off a jump he must have shown up on radar”

destroyed his Veloce by smashing a tight line across the rock garden to briefly take the lead off Loeb, but who got so much air off one of the jumps he must have shown up on radar.

In the final, Loeb led before picking up a puncture. Munnings chased down Taylor and, after the driver switch, her Andretti United team-mate Timmy Hansen (Kevin’s brother) got ahead of countryman Johan Kristoffersson. The championship leader pulled back alongside Hansen but took a jump too aggressively, causing his car to conk out and deny Nico Rosberg’s team a third consecutive win. JBXE came second and Acciona Sainz third. Andretti United’s victory marks the high-point of former CBeebies TV presenter Catie’s career thus far.

The competition between the sexes is perhaps the most enthralling element. “What we’ve seen from the female drivers has been extraordinary,” says Agag. “We’ve built a platform where they can shine.”

Once again, Extreme E delivered high-energy entertainment and thought-provoking coverage but, like the eco issues it’s getting race fans to engage with, it has a challenge on its hands when it comes to the Odyssey 21. “They have some work to do on the cars,” noted Timmy Hansen. “They have to be stronger, but still we had some great racing, and there’s so much more to this than the technical side.”

Extreme E is a start-up, and there were always going to be teething problems. The pandemic is an additional headache, which caused the cancellation of the rounds slated for South America. Instead, the next race takes place in Sardinia on October 23-24. The Island X Prix will highlight the Mediterranean region’s heatwaves and wildfires. The final round of the season will take place in December and locations being considered include Egypt, Morocco and Greece. **o**

## The life aquatic with Extreme E

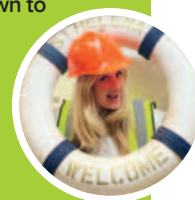
Welcome aboard *St Helena* – a floating paddock

Extreme E has two paddocks. The first is the rows of khaki-coloured tents at the race site that include the nine team garages and outside broadcast centre, and which looks rather like the set of *M\*A\*S\*H*. The other is floating nearby.

The 105-metre *St Helena* is a 32-year-old former Royal Mail ship which has been expensively refitted to transport all the championship’s cars and logistical equipment. With 62 cabins, it also hosts drivers, VIPs and senior personnel during race week. The *St Helena*’s engines are not electric, but they have been converted to run on low sulphur diesel. It keeps the championship’s carbon footprint much lower than if the cars were flown to each round, as happens with other motor sports.

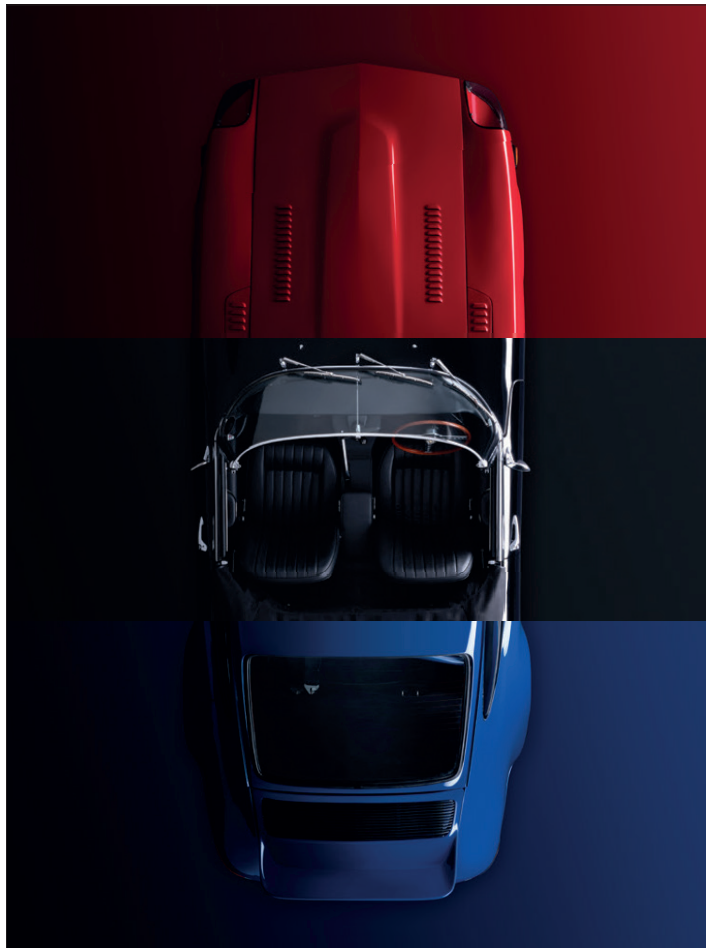
Each evening, the ship’s guests hear presentations from scientists and sustainability advocates. A permanent presence is DJ/ model turned environmental activist Izabella Rekiel, *inset*, who is aboard as the series’ impact correspondent, posting content on her Instagram page.

Scientists are invited to take a residency for each leg of the season. The current pair, marine biologists from the University of Algarve, are studying North Atlantic seawater and sequencing DNA to see how changing conditions are altering marine life. XE mastermind Alejandro Agag was inspired by Jacques Cousteau’s *Calypso*, and describes the *St Helena* as “the soul of Extreme E”.



‘Not electric... yet!’ reads the slogan on the side of Extreme E’s *St Helena*





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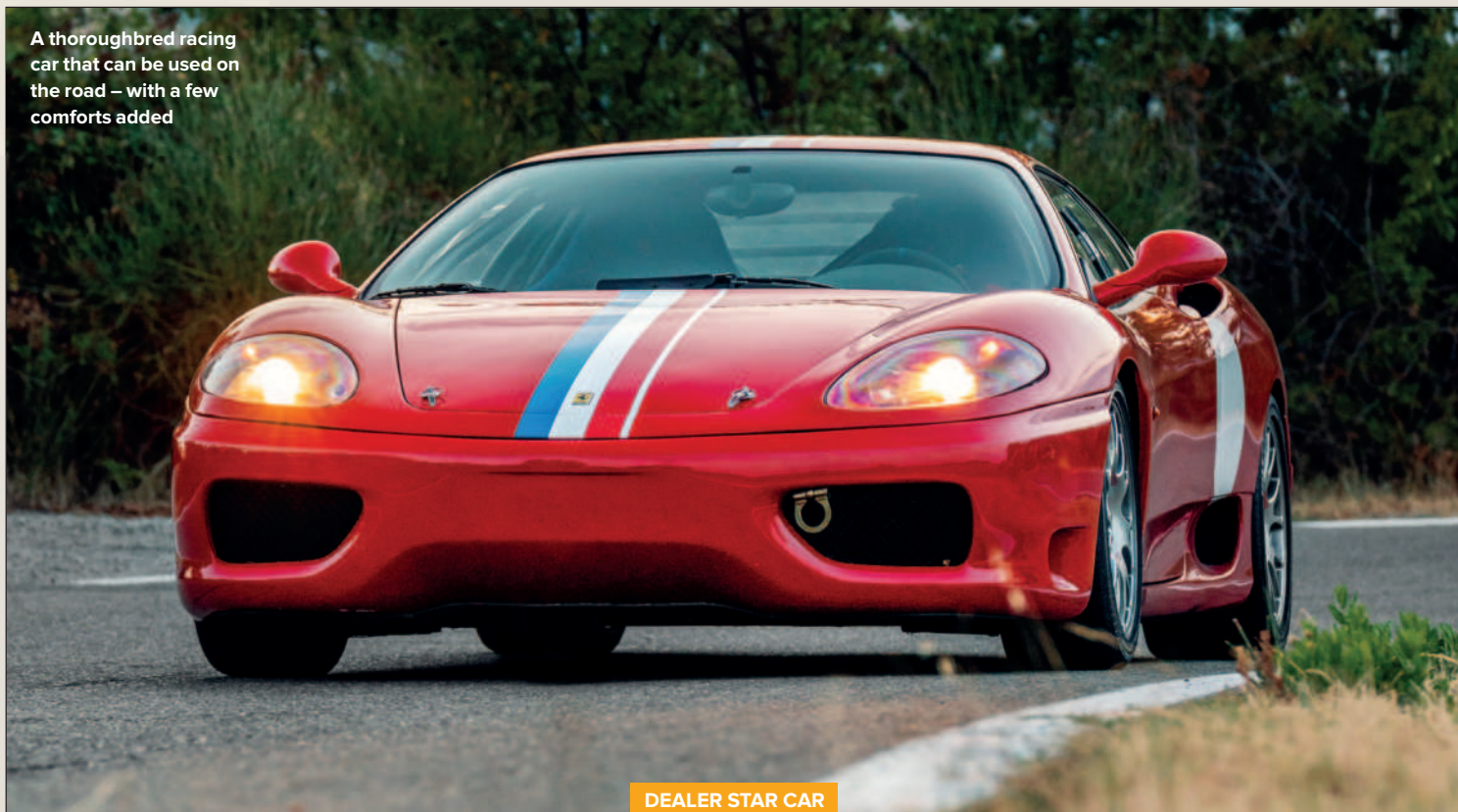




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CAR MANUFACTURERS TRY THEIR best to predict what people want, often going to great lengths to offer all the options anyone could possibly ask for – but, as the old adage goes, ‘You can please some of the people some of the time but...’

In the case of the 360 Modena, launched in 1999, Ferrari offered a regular road car in

coupé and open forms, fewer than 200 Challenge versions designed purely for the factory-backed race series of the same name and – for those who wanted a bit of both worlds – the Challenge Stradale, which combined some of the competition-orientated features of the latter with the necessary equipment to make it street legal.

As a true ‘driver’s car’ suitable for track days and regular use, the Challenge Stradale

remains highly regarded – and with 1288 made, examples are relatively easy to come by.

But for a previous owner of the 360 pictured here, the factory’s road-legal effort wasn’t good enough: deciding he wanted a genuine Challenge racer that could be driven on the road, he spent an small (well, probably large) fortune converting the car campaigned by Slovenian former karting star and Porsche Supercup competitor Nina Jerancic, who





The car was raced by the Slovenian driver Nina Jerancic from 2004-06

Below: the steering wheel is suede-trimmed, and you can just see the racing bucket seats in blue Alcantara. Bottom: in competition in the Inter Coppa Shell championship



brought it to fourth place in the 2006 Italian Ferrari Challenge championship.

After registering the car in Italy, the new owner marginally 'softened' its ride to make it more suitable for the road, replaced the rapid refuelling system with a more conventional filler cap, installed bucket seats and integrated an analogue fuel gauge, hazard lights, a hydraulic handbrake, a USB charging port and, even, air conditioning. Clearly a stickler for detail, the owner also arranged for the ignition key to be set into a 3D-printed 360 silhouette.

Still very much present, however, are the Challenge-spec titanium con rods, straight-through exhaust and upgraded brakes and clutch, along with the weight-saving carbon-fibre door cards, BBS wheels and Lexan side windows and engine cover.

The result, says Girardo & Co, is a car that's "raw and alive" but, thanks to those few concessions to road use, is "approachable and usable, and obedient and docile at low speeds".

"The simple process of swinging open that feather-light door, clambering into those big, shoulder-hugging bucket seats and gripping the suede-trimmed steering wheel is sensory overload - and that's before you've thumbed the ignition button," enthuses the dealer, which goes on to describe the Challenge's performance as "breathtaking".

Up, running and ready to be enjoyed on road and track during the dying days of the European summer, it was recently given a full mechanical service that included new timing belts and Bridgestone tyres.

A word of warning, however: if you're shy, don't apply... in terms of sound and looks, this car is every bit as loud and unmissable as the late lamented Pavarotti.

#### ROAD-LEGAL FERRARI 360 CHALLENGE

On offer with Girardo & Co, Oxford.  
Asking £128,900, girardo.com

#### DEALER NEWS

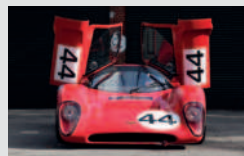
## A direct link to Steve McQueen's *Le Mans*

● It seems you're never far from a car with irrefutable ties to **STEVE MCQUEEN**. This recently reassembled **CHEVRON B16**, chassis b16-70-26, *below right*, was bought by the actor's Solar Productions and raced by Clive Baker/Digby Martland at Le Mans 1970 (DNF), which in turn gave it a role in McQueen's plot-flimsy '71 film *Le Mans*. It's on sale at **LEGENDS AUTOMOTIVE** in Bicester for £225,000.

● With 'revenge buying' all the rage, the used-car market is now sizzling - but which car's price has risen most? That honour goes to the **MERCEDES V-CLASS DIESEL** (2014-19) vans. At the three-year/30,000-mile mark its value has rocketed by £11,000 in six months.

● In July car production in the UK fell to its lowest level since 1956, says the **SOCIETY OF MOTOR**

**MANUFACTURERS AND TRADERS**. 53,438 cars were built, a fall of 37.6% compared to last July. "The semiconductors shortage shows little sign of abating," says SMMT's chief executive Mike Hawes.



● If you think that's gloomy, in 1949 the UK government was urging businesses to 'Export or die'. **AUSTIN** did its bit with the streamlined **A90 ATLANTIC**, aimed at the American market. But of almost 8000 made, just 350 ended up in the US. Corrosion ate A90s alive and now there are fewer than 60 left. You'll find a '49 fully restored convertible at **ST ANDREWS AUTOS** in Chelmsford for £29,950.

● Research by car finance company **MONEYBARN** has revealed the best and worst places in the UK to buy a used car. Bottom, with much soul-searching to do, is **BURTON UPON TRENT** where 52% of reviews for its dealerships were 'terrible'. Sitting in sunlit uplands is **BOLTON**, where 75% of dealers were rated as 'excellent'. Please form an orderly queue on the A666. **Lee Gale**



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**1966 Aston Martin DB5 Vantage  
 Shooting Brake**

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This exquisite DB5 Shooting Brake is 1 of just 12 examples, converted by renowned coach builders, Harold Radford & Sons. Chassis DB5/2047/R was manufactured at the Newport

Pagnell factory in 1965 as a saloon and finished in California Sage over Red hides, the livery it wears today, prior to delivery to Harold Radford for the factory commissioned shooting brake conversion.

Returning to the factory following the conversion, this car was then fitted with a Vantage

specification engine, the only 1 of the 12 cars to have been delivered as such. Acquired by its current, UK based Aston Martin collector owner in 2011 who subsequently committed to a 'no expense spared' restoration, encompassing all aspects of the car, by a leading Aston Martin specialist, completed in 2014, to the very highest standards as presented today.



**1965 Aston Martin DB5 Vantage**

£POA



**1963 Aston Martin DB4 Vantage GT**

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**1967 Aston Martin DB6 Volante**

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**1971 Aston Martin DBR2 Recreation**

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**1988 V8 Volante Zagato Vantage**

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**1968 Aston Martin DB6**

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Just 750 Torino Talladegas were made, all in 1969 – and of those, 258 were Royal Maroon (Wimbledon White was the most popular – 286)



AUCTION HERO

## Brawn supremacy

Ford's Torino Talladega became a late '60s NASCAR legend, while its road-going version was the Lou Ferrigno of muscle cars. **Simon de Burton** checks a street-legal, track-ready rarity

**M**ENTION THE NAME FORD Torino to some of a certain age and they will immediately picture an image of the red-and-white 'Striped Tomato' Torino that featured in the 1970s TV series *Starsky & Hutch*.

Scholars of the historic NASCAR scene, however, are more likely to think of the Torino Talladega, the rare and remarkable muscle car that the mighty Blue Oval produced in just 750 examples during 1969 in order to meet NASCAR homologation requirements.

Based on the Fairlane Cobra fastback (or 'Sportsroof' as Ford liked to call it), the two-door Talladega featured a more aerodynamic nose that lost the regular car's inset grille and headlamps and added a flush-fit bumper fashioned from the standard rear unit and shaped to serve as a crude air dam.

The Talladega was also subtly lowered, with one of the more outwardly obvious tell-tale features being a matt black 'hood'. Less apparent were the additional oil coolers for engine and power steering, the heavy-duty transmission and upgraded differential.

The result was a road-legal coupé with performance that few other production cars could match, especially in the case of later models that, in regular examples, substituted the old FE 427 'side oiler' V8 with the all-new 428ci 'Cobra Jet'.

Competition versions of the Talladega won a total of 29 Grand National races during the 1969 and 1970 NASCAR seasons, eclipsing the efforts of rivals Chrysler and Dodge and taking the laurels in the 1969 NASCAR Manufacturers' Championship.

Of the 750 cars recorded to have been built, all were finished in either Wimbledon White, Presidential Blue or Royal Maroon – as seen on this Talladega that's set to cross the

block with Mecum. Having been built from a road car into a NASCAR replica, it's not exactly 'stock' but runs a Boss 429 engine that's fitted with numerous exotic parts and is said to produce a tyre-shredding 870bhp at 6500rpm.

Indeed, so powerful is the car that it was one of just six invited from across America to take part in the 2012 Dyno Wars contest held at Shelby American's HQ outside Las Vegas. It has also made guest appearances at Atlanta Motor Speedway, Willow Springs Raceway, Milwaukee Mile Speedway, St Louis Gateway and, of course, the Talladega Speedway after which the model was named.

Featured in numerous hot rod magazines and with a radiator surround signed by no fewer than 17 American auto luminaries, *left*, including Jack Roush, Junior Johnson, Bill Holbrook, Henry Ford III, David Pearson, and Cale Yarborough, it is described by Mecum as being track ready. Perhaps more excitingly, it's street legal, too.



### 1969 FORD TORINO TALLADEGA

For sale with Mecum Auctions, Las Vegas, US, October 7. Estimate on request





AUCTION PICKS

# A sincere form of flattery

**Simon de Burton** reveals the best of the rest, including this ground-up Escort rebuild

**1973 FORD ESCORT TWIN-CAM REPLICA**  
SOLD BY COLLECTINGCARS.COM, £24,250

During the two years that I scraped a living buying and selling classic cars in the 1980s (giving up just before the 'boom'), a dealer friend bought a superb replica of an RS2000 works rally car for £500, sold it for £850 – and was threatened with court action by the buyer when he realised 'it wasn't a real one'. Times have changed. Although street legal, this Twin Cam replica was built for competition and was bristling with modifications, at the heart of which was a tuned 2.4-litre Zetec engine. The attention to detail was excellent – and the price it fetched surely represented a fraction of the build cost. Ouch.



**1961 DOLPHIN AMERICA SPORTS RACER**  
SOLD BY BONHAMS, £43,855

This pristine Dolphin was sold from the estate of the late LA superior court judge Joseph DiLoreto. The company was set up in 1959 by US engineer Bud Hull and English designer John Crosthwaite.



**1968 HUSQVARNA VIKING 360**  
SOLD BY RM SOTHEBY'S, £147,900

The latest of several Steve McQueen-owned Husqvarna bikes to have crossed the block in recent years, this is the one that caused his interest in the marque after he saw Bengt Åberg racing it.



**1970 LAMBORGHINI MIURA P400S**  
SOLD BY GOODING AND COMPANY, £942,560

This Miura proved to be the top seller among a collection of seven cars owned by the late Rush drummer Neil Peart. He called the cars, six of which were painted silver, his 'Silver Surfers'.

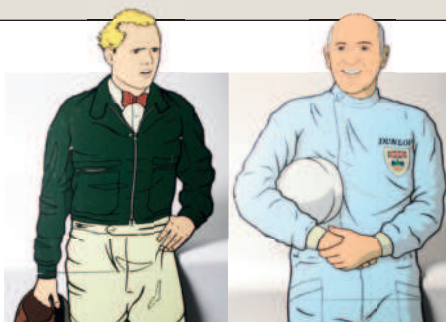




#### 1980 PORSCHE 935 K3

**SOLD BY GOODING AND COMPANY, £1.4M**

This was the most successful 935 developed by Kremer Racing. It was originally built for Ted Field's Interscope team, the livery of which it wears today having been the subject of a thorough restoration.



#### 'EXCITING FIGURES' RACING DRIVER CUT-OUTS SOLD BY BONHAMS, £153

If you've run out of real people to bore with tales of your driving exploits, life-size cut-outs of Jim Clark, Sir Stirling Moss and Mike Hawthorn might lend an ear. Each was from an edition of 100 on foam board.



#### 1962 FERRARI 268 SP

**SOLD BY RM SOTHEBY'S, £5.6M**

Classic car prices may have softened but there are still buyers willing to battle for the best of the best - as evinced by the sale of this former NART Ferrari, which has had just two owners since 1969.

### FORTHCOMING SALE HIGHLIGHTS

#### ● BONHAMS, KNOKKE-HEIST, BELGIUM, OCTOBER 10

If the Belgian coast has never been top of your list of destinations, you probably haven't heard of the resort of Knokke-Heist. Bonhams has held an annual car sale there for more than a decade, with this year's event being highlighted by a 1994 Bugatti EB110 SS with an engine featuring additional tuning tweaks.

#### ● BONHAMS, LONDON, NOVEMBER 5

Anyone who's worried that the shift towards electric-only car production is going to kill classic car values might have their fears allayed by the success of Bonhams' Golden Age of Motoring Sales. They see big money paid for cars dating back to 1886 - many of which were considered defunct by the 20th century.

#### ● SILVERSTONE AUCTIONS, BIRMINGHAM, NOVEMBER 12

The star of this sale's extensive motorcycle section is likely to be a Brough Superior attached to the Alpine Grand Sport Cruiser sidecar with which it was ordered new in 1939. The chair is of the 'petrol tube' type designed to carry additional fuel, while extras include Monarch forks and Amal touring handlebars.

#### ● RM SOTHEBY'S, LE CASTELLET, FRANCE, NOVEMBER 19

This sale comprises 75 exceptional cars from the collection of Jean Guikass, the historic racer and classic enthusiast who began buying in 1989 and turned a hobby into one of the most renowned dealerships in Europe. Among the lots are a 1978 Renault-Alpine A442 and a 1993 Jaguar XJ220 C LM.



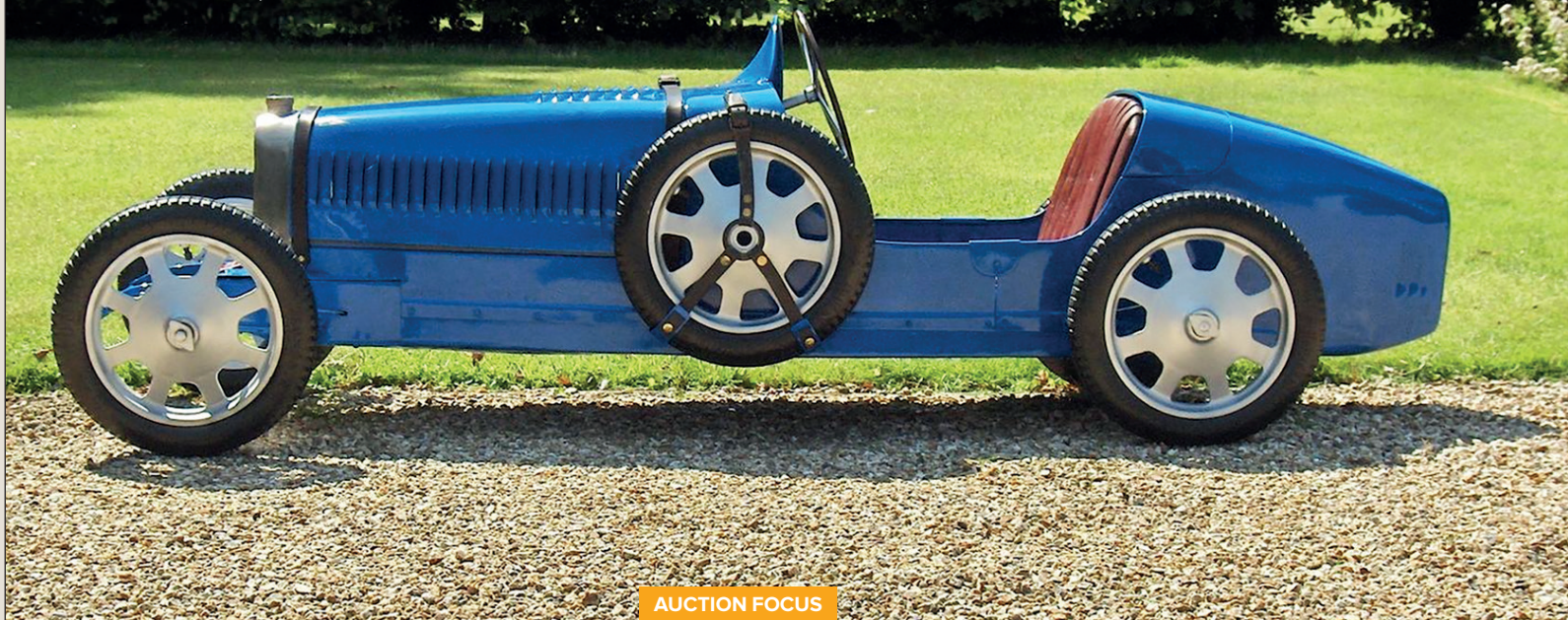
#### 1992 AIRSTREAM MODEL 34 CARAVAN

**SOLD BY BONHAMS, £170,580**

This 34ft Airstream might well turn up at America's race tracks serving as team accommodation. It was sold by Hollywood A-lister Tom Hanks, *inset*, who bought it as a 'home from home' to use on location while making films such as *Forrest Gump*, *Sleepless in Seattle* and *Apollo 13*.



Bugatti's electric *Bébé*, a half-sized 35/51 built from 1927-36, is a prime trophy for any junior car collection. In 2017 one sold for £67,700



AUCTION FOCUS

## Pedal to the metal

With years to wait until a driving licence, kids once skidded around the streets in self-propelled cars. **Gordon Cruickshank** knocks on your door and asks if you're playing out

**E**YEBROWS LIFTED A COUPLE OF years ago when Jaguar Land Rover announced a sale of 140 vehicles, all of them as green as they could be, with not a petrol engine among them - because they were all pedal-powered. The sale was part of the vast James Hull collection which JLR purchased in 2014, including the kiddie-car-parkful of junior transport, items which have an appeal of their own to car fans of all ages. And not for that front lawn grand prix. Many will end up in garages alongside the real thing, or indoors for pure display.

Pedal cars have been around almost since the dawn of the real thing, and became popular in the early 1900s. Of course they're still around, although they've long left behind the basic format; now an electric motor is likely to do the legwork, and at the deluxe end they can exceed the price of a real family hatchback.

Simplistic early efforts soon became realistic: before World War I, Bon Marché in France offered a junior grand prix Peugeot. But the most appealing and desirable items

coincide with the twin peaks of pedal car style, the 1930s and the 1960s, before plastic took over. By the 1930s the best pedal cars were impressively built with enamelled steel panelwork, chrome trim, leather seats and opening bonnets and doors, and this is where prices peak - in the US in 2012 a lovely '20s Packard with windscreen and plated grille made £14,160. In contrast the deco-style Skippy racer with swivelling faired front mudguards is much more common and affordable.

**"The E-type was one of Tri-ang's biggest '60s sellers"**

Over here, Tri-ang offered some 30 different designs, though you would be lucky to find the electric Rolls-Royce which topped the range. Easier to locate is the 1950s Austin J40, built in large quantities by disabled miners in Wales and a big seller, thanks partly to its use by junior driver training schools and every Austin showroom. That's the model that stars in Goodwood's Settrington Cup race. In fact they've been revived lately; continuation cars exist even in this small world. But its predecessor is on every collector's list - the Pathfinder, a neat replica of the pre-war

Austin 750 racer with dummy twin-cam engine. And a price tag of £25 - which was a fortune in the '50s. Good luck finding one for less than £2500.

From the 1950s pedal cars became ever more real: in the US you could buy your child the Thunderbird or Impala you always wanted; over here, what else but an E-type Jaguar, one of Tri-ang's biggest 1960s sellers.

From here plastic took over and collector interest falls off (although there was a groovy 1970s Tri-ang beach buggy). As always, condition and completeness rule, though pedal cars usually suffer from their junior drivers so restored examples are easier to find. But less charming.





### SKIPPY RACER, 1935

American National was the world's largest manufacturer of pedal cars in the '30s and the streamlined Skippy was a big success, featuring enclosed swivelling front fairings and a dramatic tapered tail.

SOLD Sotheby's, £2600



### AUSTIN PATHFINDER, 1949

For the indulged child of wealthy parents who recalled Austin's pre-war flash of racing glory, the costly Pathfinder offered a faithful-ish profile of the single-seater plus spark plugs to play with. Rare, and thus prime collector bait, with prices in the thousands.

FOR SALE Ebay, £7995

### AUSTIN J40, 1955

With its opening bonnet revealing a mock engine with spark plugs, opening boot with spare wheel, and working lights and horn, Austin's J40 offered plenty of play value for 1950s – and 2020s – kids. This example was completely restored but J40s turn up in all conditions.

SOLD Sotheby's, £7200



### UNKNOWN, C.1950

Sweeping wings and enclosed rear wheels suggest a 1950s date for this steel-bodied job, believed to be French.

Unrestored but in good condition, it sold at H&H's online auction in March.

SOLD H&H, £1150

### MY PRIZED POSSESSION

## 2009 LE MANS WINNER'S TROPHY

### DAVID BRABHAM, SPORTS CAR VETERAN

"After 16 attempts and two GT1 class wins, standing on the Le Mans podium as a Peugeot Sport driver with the outright winner's trophy in hand was an amazing feeling. Post-race duties done, I finally got the chance to collect and admire my trophy, only to find there was only one left – and it was the wrong one for P2! I went to Audi and found that Allan McNish had taken mine by mistake! We had a good laugh and I walked away even happier... not only did I have my winner's trophy, but I'd won it back from Allan!"



## THE EXPERT VIEW



### Perfect half-measures

Considering it's a relatively young area of collectibles, the half-scale helmet market has exploded in recent years and some examples are quickly becoming very valuable.

Minichamps began making the first half-scale helmets during the '90s and back then they were made by a model producer, not a helmet manufacturer. The range was mostly MotoGP riders, but Ayrton Senna also featured.

Bell was the first helmet manufacturer to change the game when it began offering the ability to commission half-scale helmets alongside ones it made for teams, sold under the Bell Sports brand, with the selling point 'the same technology as the real ones'. Michael Schumacher, Jean Alesi and Jacky Ickx were in the range. Few survive, and even less in their boxes, so as a result their value has skyrocketed – and if signed, some change hands for four figures. Not bad for an item that cost less than £100.

Initially Bell painted the shells, but as numbers increased it changed the process, which often resulted in 'bubbling' around the base and visor opening, which affects values. There was a limited run of Senna 1984 Toleman 'Segafredo' helmets. Almost the entire run bubbled and were returned to the factory, so if you find one, the price will be high.

Today teams and drivers are waking up to this market and taking control of their own replicas. Now if an F1 or IndyCar driver has a supply deal with a helmet manufacturer, there is often a limited run of half-scales made, which they sell through their own channels to fans, or through the teams as official replicas.

There are many lids to choose from these days, so buy your hero or the designs you like, look out for condition and try to buy with an original box.

Happy half-scale hunting!

Andrew Francis is director at The Signature Store. [thesignaturestore.co.uk](http://thesignaturestore.co.uk)







THE SHOWROOM

# *Motor Sport collection*



**Editor's choice**

## Contemporary Hamilton

Whether hunting for gifts or buying for yourself, you'll find a miscellany of track-friendly ideas at [motorsportmagazine.com/shop](https://motorsportmagazine.com/shop)

### JOHN KETCHELL ORIGINAL ARTWORK

There are few things more special to own than an original painting. Prints are all well and good, but nothing ever beats the story, passion and prestige behind an original work. From the textures of the brushstrokes to the feel of the canvas, it all adds to the magic of them.

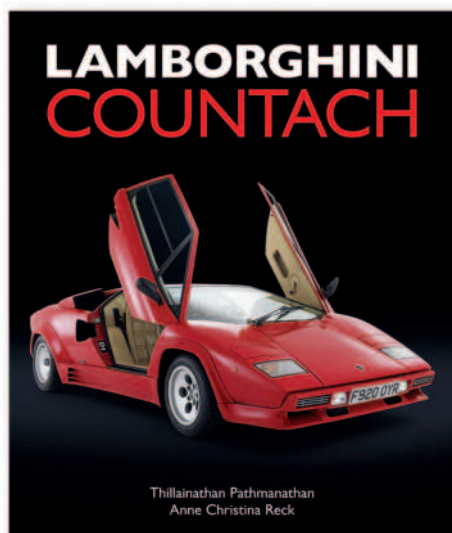
John Ketchell is a world-renowned motor sport artist and has already created a long line of pieces

for both leading companies and individuals, and every now and then some of his work reaches our door. Having studied at art school in Preston, Ketchell opted to devote himself to his passion for speed and initially tried photorealism in his work, but soon became frustrated at how such a style never did quite convey the speed of a racing car. Inspired by the French impressionists, Ketchell

instead turned to a more abstract style, using acrylic on canvas to create the dream-like haziness of his images. He's done everything from Auto Unions to Porsche 917s and classic F1 cars, but he also edges into contemporary every now and then.

This latest one focuses on Lewis Hamilton aboard the Mercedes-AMG F1 Team's 2021 F1 W12. It's a real one-off. £3600



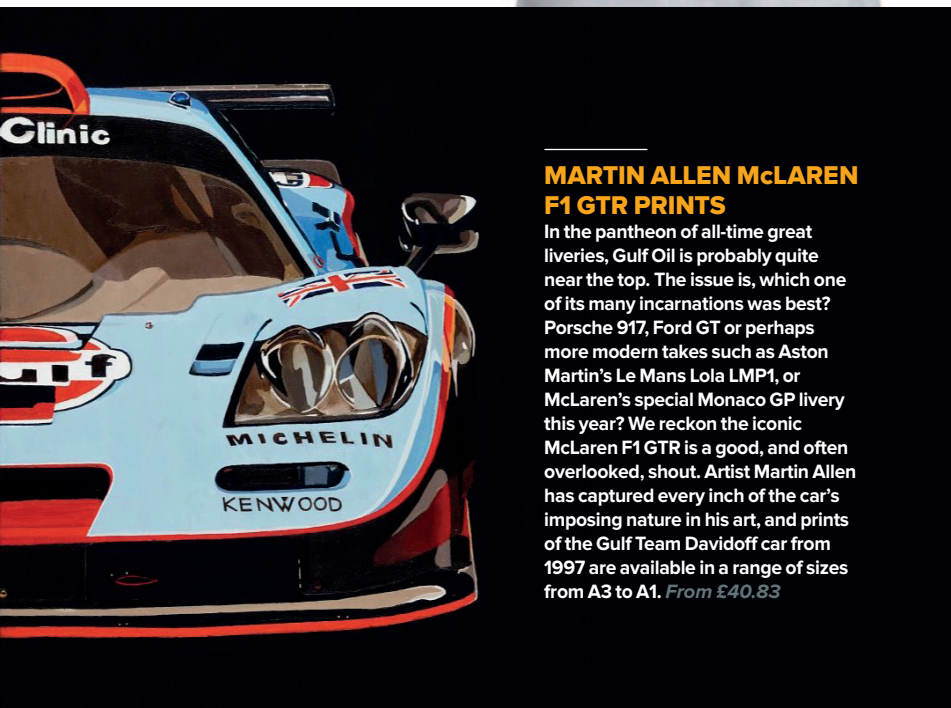


### LAMBORGHINI COUNTACH BOOK

If you were a child of the '80s (or even a big kid) then it's likely you had a poster of one of these on your wall at some point. When introduced at the Geneva Motor Show in 1971, Lamborghini's Countach rewrote car design with its futuristic lines, screaming V12 and sci-fi scissor doors. Between 1973 and its eventual replacement by the Diablo in 1990 (a feature on the latter can be found in our Showroom section) Lamborghini made just 1997 examples, making it exceedingly rare. This 400-page book explores the full story of the model and celebrates every aspect of its history, as the design approaches its 50th anniversary. £60

### CLASSIC TEAM LOTUS T-SHIRT

Following hot on the heels of the ultra-cool retro Tyrrell apparel we brought you recently comes this equally ultra-cool Classic Team Lotus tee featuring one of motor racing's all-time great double acts: Jim Clark and the Lotus-Cosworth 49. Each officially licensed shirt is 100% cotton and printed with ultra-high resolution artwork depicting Clark aboard 49 chassis R2 – the very car he raced to victory in the 1967 British Grand Prix. £18.50



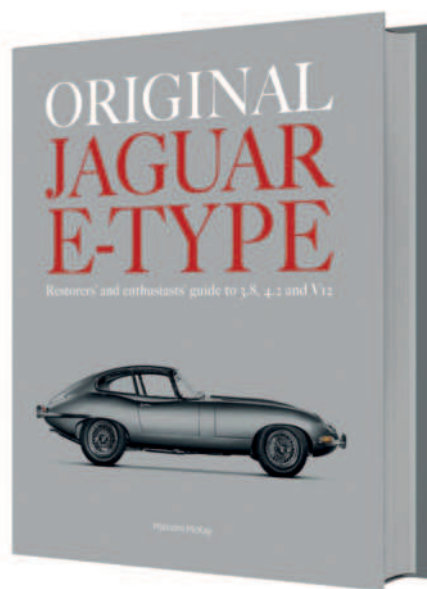
### MARTIN ALLEN MCLAREN F1 GTR PRINTS

In the pantheon of all-time great liveries, Gulf Oil is probably quite near the top. The issue is, which one of its many incarnations was best? Porsche 917, Ford GT or perhaps more modern takes such as Aston Martin's Le Mans Lola LMP1, or McLaren's special Monaco GP livery this year? We reckon the iconic McLaren F1 GTR is a good, and often overlooked, shout. Artist Martin Allen has captured every inch of the car's imposing nature in his art, and prints of the Gulf Team Davidoff car from 1997 are available in a range of sizes from A3 to A1. From £40.83



### MOTOR SPORT RACING AT THE MOVIES 2022 WALL CALENDAR

A high-quality calendar is the gift that just keeps giving all year round, and our calendar range has been a hit for quite some time now. This season the focus shifts to Hollywood, with each month on Racing at the Movies presenting unique snapshots of the greatest racing films of all time. From classics like Steve McQueen's *Le Mans* and *Grand Prix* through to modern-day greats like *Le Mans '66* (or *Ford v Ferrari* if you're not British), *Rush* and *Senna*. £29.99



### ORIGINAL JAGUAR E-TYPE BOOK

If you're lucky enough to be in the market for a Jaguar E-type, or are even more fortunate and actually own one, then you'll be wanting a copy of this. Malcolm McKay's work was released to coincide with the 60th anniversary of Jaguar's most famous model and tracks the intricate design and engineering quirks of every one of its iterations – from Series 1 cars to V12s. As its subtitle states, it really is a guide to originality for owners, restorers and enthusiasts. £65

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With hundreds of special and unique racing-themed products, and many new items regularly added, the *Motor Sport* shop is aimed at both serious and casual collectors with a wide range of prices to suit your budget. Visit [motorsportmagazine.com/shop](https://motorsportmagazine.com/shop)





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The Philippe Charriol SuperSport Trophy from 1996-2002 was Lamborghini's first foray into a one-make racing series



BUYING GUIDE

LAMBORGHINI DIABLO SV-R SUPER TROPHY

- **Price new** N/A
- **Price now** £400,000-£900,000
- **Engine** 5.7-litre V12
- **Rivals** Porsche 964 Carrera Cup, Ferrari 348 Challenge, TVR Tuscan Challenge
- **Verdict** Aside from the Porsche, nothing comes close to the historical importance of the SV-R

# The most raging bull

Sometimes things go further than just a single-make series, says **Robert Ladbrook**. This racer sparked a sports car revolution

SOME MAY TRY TO LUMP THE ORIGINAL Lamborghini Super Trophy into the same category as so many other run-of-the-mill single-make racing championships, but you shouldn't. Porsche's behemoth Carrera Cup notwithstanding, there isn't anything else that can touch the Lamborghini Diablo SV-R in terms of the impact it had on global sports car racing.

By way of explanation, this is not only the granddaddy of modern GT3 cars, but also of modern GT3 racing. Without the Diablo Super Trophy in the mid-1990s, GT3 might never even have existed and, much like everything else in GT, it took the pioneering spirit of Stéphane Ratel to bring it to life.

Being only a few years into his career as a race organiser with first the faltering Venturi brand and then the smash-hit BPR Series for GT1 and GT2 machinery, Ratel was on the lookout for a new manufacturer

partner come 1995 when Venturi killed off the Trophy. Cue a visit to Lamborghini in Sant'Agata, which at the time produced two and a half cars a day and was in need of an interest hike. The Countach had been retired, replaced by the Diablo as the flagship, and Ratel thought the time ideal to drag the company kicking and screaming into motor sport.

And he did so with a very clever plan. By partnering with finance firm LeasePlan France, Ratel came up with a simple package of selling a production-based supercar complete with everything needed to go racing, and condensing it all into a monthly payment across the year. To sell it further, customers even got a box of bits to make the cars road legal at the end of the plan, should they wish. The concept was to make racing accessible, and (within reason) affordable against the bespoke GTs nobody but the factory itself could afford.

Lamborghini responded by uprating the Diablo all-round. Brakes were beefed, suspension stiffened, glass swapped for plastic and the 5.7-litre V12 breathed on to make 540bhp. In total Lambo reckoned it fitted some 250 new components to create the racing SV-R. By May 1996, a single test car was complete and just a month later Lamborghini sent five trucks with 28 cars aboard to the first race - running on the undercard of the Le Mans 24 Hours. Quite an entry, that... together with being the world's only V12-powered single-make series.

Ratel and his SRO group used the Philippe Charriol SuperSport Trophy (to give it its full title) to hone the new production-based regulations that would become GT3 a decade later, to experiment with Pro-Am driver partnerships, to run mixed race formats of sprints and enduros, and to pilot both driver-grading and Balance of Performance. Lambo's in-house racer was the test bed for everything GT racing is today.

A total of 32 Diablo SV-Rs were produced and the series ran from 1996-2002 before being replaced by the Super Trofeo we know today. ●



## ONE FOR SALE

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An Austin 7 'five-seater' in 1923 with ample space for pets. Seatbelts were still decades away



BUYING GUIDE

# Little goes a long way

**Robert Ladbrook** looks at the tiny car that changed road travel forever and launched more than a thousand racing variants

**B**ACK IN THE EARLY 1900S, YOUR automotive options were rather limited, to say the least. On the one hand if you were rich, you were fine: with hefty Ford Model Ts, Panhards, Mercedes and such about. If you weren't suitably flush, well... you could have a flimsy cycle car, a motorbike - or walk.

That was the case until the Austin 7 arrived in the 1920s, the diminutive 700cc wonder that brought private motoring to the people on a scale never seen before, or arguably since.

It's safe to say the Austin 7 will go down as one of the most significant automotive creations in history, with almost 300,000 built worldwide. The 7 sparked new brands, including some minnow called BMW, and broke numerous racing records. Around 10,000 still exist today, a full century after the first ones rolled off the production line.

Not bad for a model that so nearly didn't get off the ground at all. Austin was among


Britain's earliest car makers, with founder Herbert Austin building his first three-wheeled automobile back in 1895 before starting work for Wolseley and eventually founding Austin Motor Company in Longbridge in 1905. Its early cars were sizeable offerings like limousines, grand tourers and coupés, but the firm struggled to gain market share and needed to think outside the rather elongated automotive boxes it had been creating.

Spurred on by the introduction of the RAC 'Horsepower Tax' of 1921 and Austin's need to drag itself out of receivership in the wake of the First World War, Austin began work on creating a small car for the masses, with simple mechanicals and a small engine to escape the costly taxation. The issue was that the Austin board and creditors weren't keen on gambling on its development, so Herbert took matters into his own hands.

With much of the design work being conducted in the billiard room of his own home,

aided by a young draughtsman named Stanley Edge, the basic 7 design and plan for the 20bhp four-cylinder engine was conceived and three prototypes built. The first production 7s were unveiled in 1922. Just 2500 were made in the first year but, as word spread of their affordability (around £110 for the entry-level model, equivalent to £6500 now), demand soon soared, with production ongoing until 1939.

The engine was upgraded to the familiar 750cc unit in 1923 and the model also sparked a racing revolution. Its lightweight chassis made it a hit, with numerous racing specials created by the likes of Arthur Waite (Herbert Austin's son-in-law) and Gordon England, who would create streamlined variants that decimated class records at Brooklands. A 7 also proved pivotal for a young Bruce McLaren in New Zealand.

The 7 proved an incredible all-rounder, with over 50 body styles developed - from saloons, to sports versions, vans and military vehicles. 



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## AUSTIN 7

- **Price new** £110 (van/tourer) to £210 (AD Saloon)
- **Price now** £3000-£45,000
- **Engine** 696cc side-valve four-cylinder, upgraded to 747cc from 1923
- **Rivals** In its day there was nothing like it.
- **Verdict** An icon, and now an ideal entry point to vintage car ownership.



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1973 **PORSCHE 911S 2.4 LTR. COUPÉ**



1997 **PORSCHE 993 RSR 3.8**



2001 **BMW Z8 ROADSTER**



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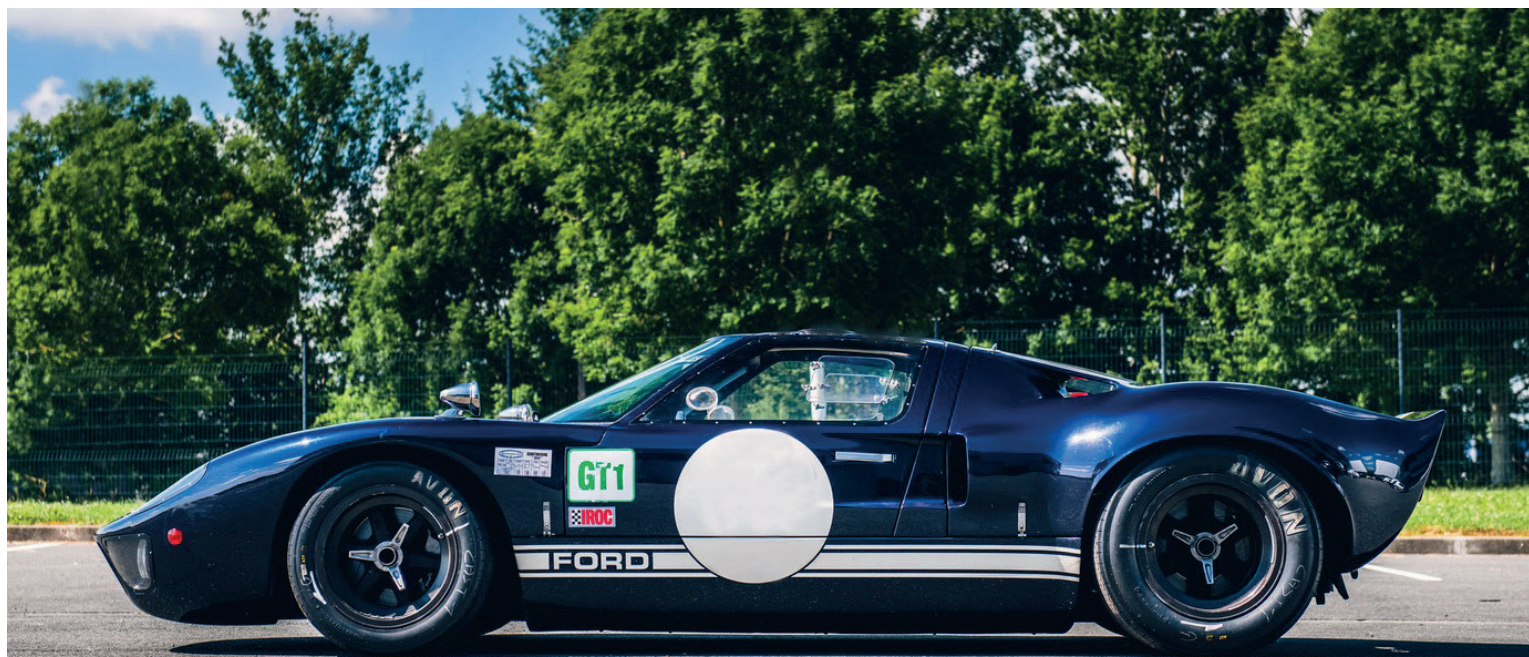


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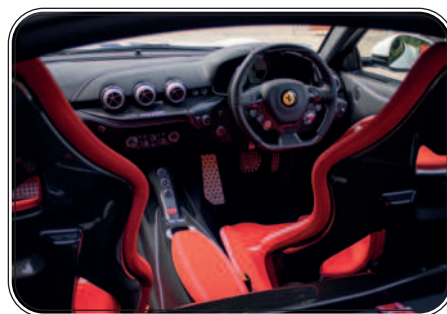




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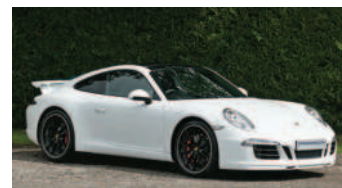
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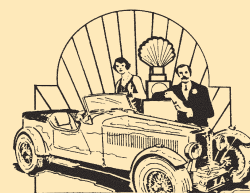
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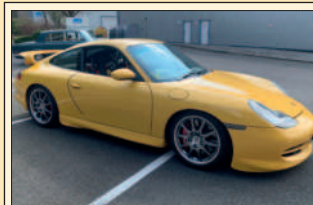
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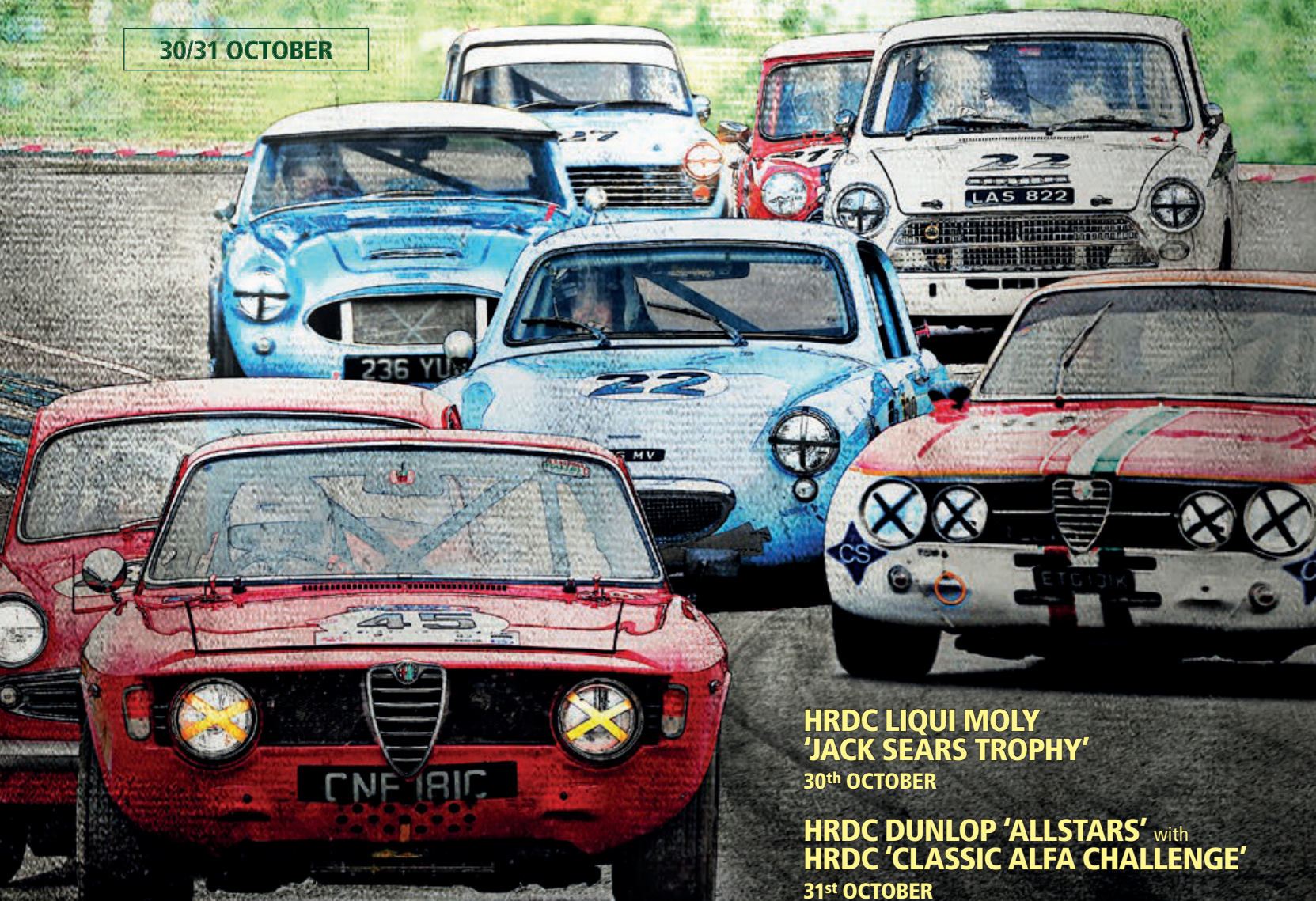
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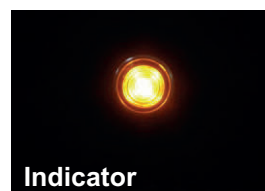


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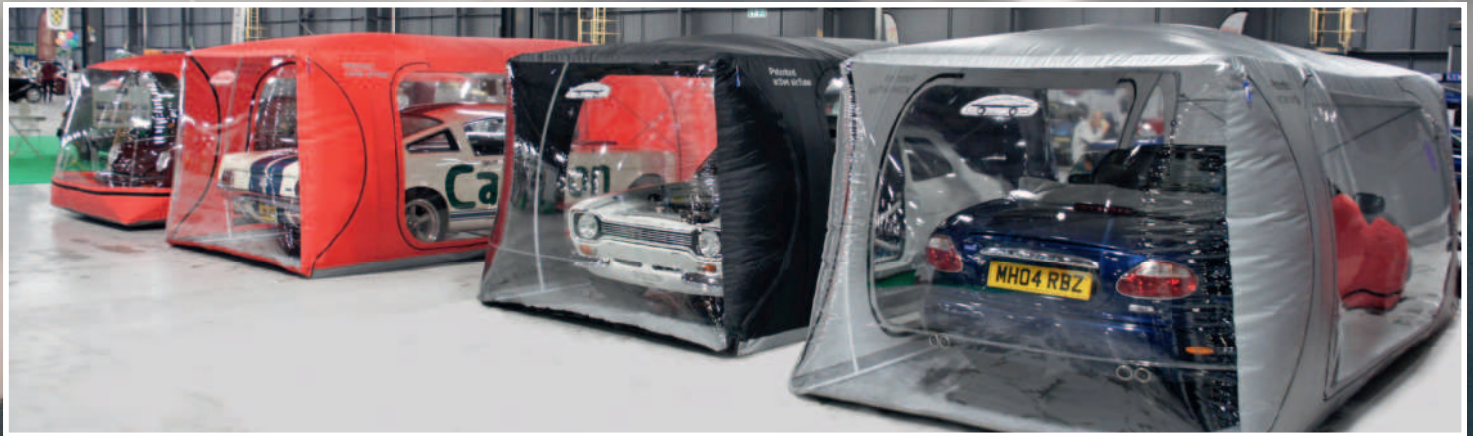
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Andrea de Adamich talking with Jackie Oliver, 1969 Oulton Park Gold Cup. Both drove F5000 cars

# Everybody has to start somewhere

Before he became an F1 commentator, PR guru and race and rally driver, **Tony Jardine** was an ordinary enthusiast, queueing for autographs and taking pictures of his heroes, including Jackie Stewart and Jackie Oliver. "Little did I know that later I would serve on the BRDC board with both Jackies!" he says

Jackie Stewart and Chris Amon pose with their H16 BRM and V12 Ferrari at Silverstone in 1967







Left: the view over the counter. Inside the pits at Oulton Park, Jackie Stewart is scrutinising events

Below left: a 17-year-old Jardine prepares for his first single-seater drive with Motor Racing Stables at Mallory Park

Below: British Grand Prix 1967 – Dan Gurney enjoys some cooling refreshment while musing on his V12 Gurney-Weslake



Junior Jardine gets Mike Spence's autograph, Oulton Park Gold Cup 1967

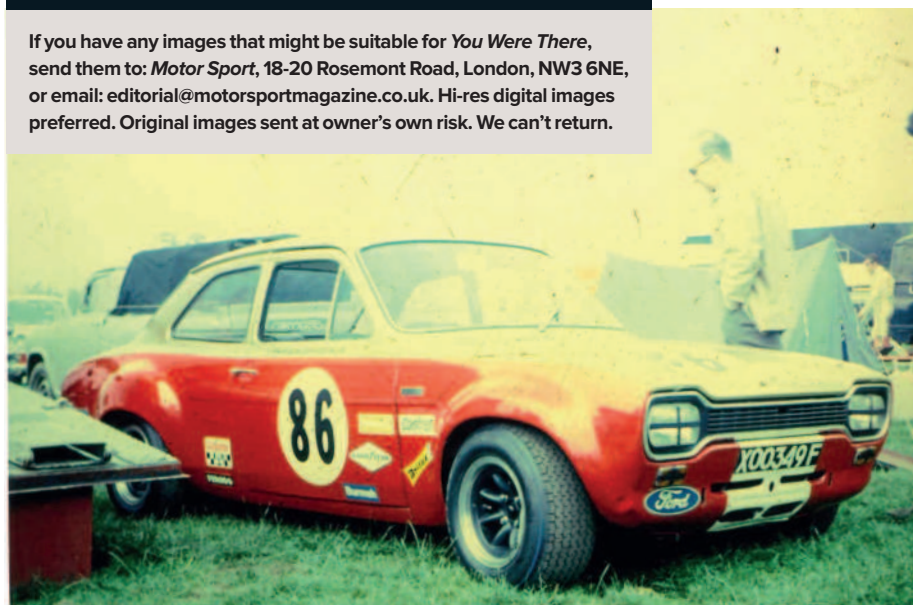


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Above: Trevor Taylor in Surtees TS5, Oulton Park Gold Cup 1969. Right: Frank Gardner's BSCC Escort, Oulton Park 1969. He finished second to a Ford Falcon







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**1966 Aston Martin DB5** finished in Midnight blue with contrasting black hide interior. This year the car has been the subject of £20,000 worth of cosmetic improvements to the interior and bodywork and is now in stunning condition throughout. Fitted with a Harvey Bailey handling kit for considerably improved road holding and coupled with a really strong engine, the car is a joy to drive. It has been in the same ownership for nearly 30 years and has always been the subject of regular maintenance. Very competitively priced for one in this condition at **£595,000**



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**1955 Aston Martin DB2/4** finished in Burgundy with contrasting Tan hide interior. Undoubtedly one of the best DB2/4's that we have encountered for many years. Complete restoration by Four Ashes specifically built as a fast road car for European touring. Having now driven this car I can confirm that it is quite exceptional in performance and yet docile in traffic when required. The cosmetic finish of the car is quite exemplary including the engine bay and the price we are asking is very reasonable for a DB2/4 in such fine condition. **£185,000**



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**1978 Aston Martin V8 Oscar India** Aegean blue with contrasting Oatmeal hide interior with Walnut dash and door cappings. The car has been enthusiast owned as can be seen by the way in which the history file has been diligently kept. It is exceptionally good to drive and likely to increase in value. **Realistically priced at £129,950**



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